

POPULAR Computing WEEKLY

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21-27 August 1986

Vol 5 No 34

**SPECIAL
supplement**

THE BBC

Music 5000 exclusive

Incentive's GAC for the BBC

News Desk

The Spectrum Plus 2 –
full details

Amstrad PC casts
doubts on PCW range

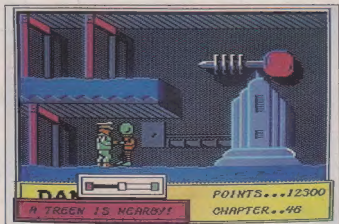
Micro chess

Starts this week

Colour reviews

US Gold smash hit
Leaderboard – now
on Atari ST

Dan Dare –
the computer
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Low cost IBM PC compatibles are in the news at the moment, with the launch of Amstrad's model coming up in September. One British company that has beaten Amstrad to it is Spectrum Group, which is importing the cheap Bondwell PC clone. John Lettice assesses its chances in the market.



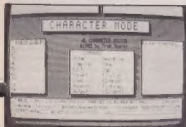
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SUPPLEMENT
THE BBC

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ABC

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Late launch for Plus 2?

AMSTRAD'S new Spectrum Plus 2 is to go on sale towards the end of September at £149. As expected the machine will have a full-travel keyboard, built-in tape deck and twin joystick ports, and will be compatible with both the 48K and 128K versions of the Spectrum.

Amstrad, however, appears to have done little or nothing more to enhance the machine. The keyboard layout is the same as those of the Plus and the 128, but most of the keywords used in

the 48K's single-key entry Basic have been removed from the keys, the exceptions being commonly-used ones such as *Load*, *Code* and *Run*. If you're programming in 48K mode you'll, therefore, need a good memory.

Amstrad won't comment on either availability or specification of the machine as yet, but it seems that I/O will be limited to a standard Spectrum expansion bus, and that the non-standard RS232 port which appeared on the 128K Spectrum has been stripped



Ring out the Plus minus?

out of the machine. If this is the case then Amstrad will have avoided the embarrassment of only having an RS232 port fitted as standard on its cheapest machine.

Amstrad is, however, con-

fident that the machine can succeed in the games market, and is mounting a major advertising push for it starting in October, the object being to take it to number one in the Christmas market.

Mastertronic claims top payout slot

MASTERTRONIC, often accused by rival software houses of giving programmers poor rewards, is claiming to be Britain's top royalty payer. According to company boss Frank Herman the company paid out £468,930 in royalties and £90,000 in advances to British programmers in the year ended June 30 1986, and he challenged other software houses to match these figures.

"The allegation has often been made that Mastertronic takes everything out of the industry and gives nothing back, but these figures answer that," he said. He professed to have no idea how many software titles the royalties were spread over, but said the company's turnover in the period had been £3-3 million.

Alpha adds five

ALPHA-OMEGA is to launch five new titles at the beginning of September. *Dekort- ing Blues* and *Death Ball* are for the Spectrum, while *Gods and Heroes* and *Aftermath* are for the Commodore 64 and *TimeLord* for the Amstrad.

All of the titles will retail at £1.99.

Pandora's Spring launch

SIR Clive Sinclair's Pandora portable computer and WSI (Wafer Scale Integration) project won't now go into production before next Spring.



Clive - funding sought

According to a spokesman for Anamatic, the company Sinclair set up to produce WSI, pre-production samples of the units have now been produced by STC, but full production will depend on further finance (see *Popular Computing Weekly*, July 17). Anamatic proposes to make a finance-related announcement in early September.

Pandora is still being worked on by Sinclair Research, but has been forced back to the drawing board by Amstrad's purchase of the Spectrum. The Pandora was intended to be based on the latter, but Amstrad has expressed no interest in produc-

ing it. The machine is still likely to be Z80-based, but will probably have at least data file compatibility with the IBM PC.

The WSI units are intended to provide cheap mass storage by using large wafers of silicon rather than individually chips wired together. The problem here - which Anamatic claims to have solved - is that conventional Ram can be made up completely of working chips, while the WSI wafers need their own on-board logic to patch out faulty sectors. Initially WSI will be purely Ram, and will be vulnerable to conventional hard disc rivals.

PCW Spell-checker

COMPUTER One has launched a spelling checker of over 60,000 words for the Amstrad PCW micros. According to the company its dictionary is twice the size of that of many programs, but despite this the product loses nothing in terms of speed, checking at 1,500 words a minute.

The program has a help facility, and can break down and rearrange dictionaries into whatever category is required. It has 46 commands, plus 15 wildcard options, and costs £34.95.

Details from Computer One, Cambridge Science Park, Milton Road, Cambridge CB4 4BH. Tel: 0223 862616.

Pyramide swelling

PYRAMIDE Software is to convert its entire range of QL products including *Nucleon* and *Mortville Manor* to the Atari ST. Prices and release dates should be available in the next few weeks.

Details from Rio Promotions, 28 Waverley Grove, London N3.

64 gets printer interface

CITIZEN has launched an interface that will allow owners of Commodore 64, 128 and Vic 20 micros to use the Citizen 120D printer. The 120D plus interface is able to produce the full set of Commodore characters and also allows the Commodore machines to produce output in both draft and letter quality. It comes with a two-year warranty, and costs £52.

Details from Citizen Europe, Wellington House, 4/10 Cowley Road, Uxbridge. Tel: 0895 72621.

PCW price cuts to follow PC launch?

AMSTRAD'S launch of its IBM compatible micro, planned for next month, is raising questions about the continuing viability of the company's PCW machines at their current price level.

The new PC 1512 is to cost £469 for a 512K system with single 5 $\frac{1}{4}$ inch drive and monochrome monitor, while the entry level PCW, the 8256, costs the same for 256K, single 3 inch drive, monochrome monitor and printer. Amstrad is clearly banking on the PCW's printer being enough to differentiate the products, but retailers are unconvinced.

Mark Horne, managing director of Softshop, plans to stock the PC, but feels that at current price levels it will damage sales of the PCW. "If I was Sugar I'd accept that the PCW would become an entry level machine, and drop the price," Horne doesn't claim to be close to the Great Man's ear, but is confident that the PC will make a breakthrough to the small business market, and will probably be more successful here than the

PCW. But, he says, "if you ask me if I'm stocking up on PCW's the answer's no."

Softshop plans to stock the PC in its "Amstrad Centre" branch in London's Totten-

ham Court Road, and is currently planning a range of about 20 software titles for the machine. These will run on other PC lookalikes, but will be cheaper than PC software has been until now -



The PCW: price cuts ahead?

Horne reckons on most of them being around the £100 mark. As Microsoft intends to issue versions of its programs for £50-£100, however, Horne's estimate may turn

out to be on the high side. Meanwhile Tandy, due to launch its 1000EX PC compatible today (August 21, see separate story) is upping the ante in the small business

Tandy stores to get new budget PC

TANDY is to join the low cost PC compatible market with the 1000EX, which costs £528 for a 256K machine with single 5 $\frac{1}{4}$ inch drive and monochrome monitor. The machine has less memory and costs more than the predictions for the Amstrad PC, but has a faster clock speed, for which Tandy claims a 50 per cent speed gain) and includes *Personal Deskmate* bundled software.

The latter is a windowing system featuring pull-down menus and including word processor, spreadsheet, electronic filing, notepad, communications and paint applications.

The company is also launching an enhanced version of its Tandy 100 lap portable, the Tandy 102, for £344. The machine has 40 x 8 character LCD display, 24K Ram and built in modem. The modem isn't yet approved for use in the UK.

Tandy has also launched a machine compatible with IBM's AT further up-market, but at its current price the machine isn't likely to threaten the hard disc PC expected from Amstrad.

Apple set to launch new Iix

APPLE has scheduled the UK launch of the Apple Iix, its follow-up to the Apple II for October 29, when it intends to hold the first UK Apple Expo at the Business Design Centre in Islington, London. Apple won't talk about the new machine, but it's expected to have a 16-bit 65816 processor compatible with the II's 6502, PC compati-

bility, monochrome monitor and twin 3 $\frac{1}{2}$ inch disc drives. It should retail for around £1,000.

Apple is currently running what it describes as a "teaser campaign" aimed at current users of the Apple II. Owners are invited to call Freephone Apple, where an operator takes their name and address and promises more information in the next few weeks.

Apple US is keeping a tight lid on the new product, but Apple UK spokeswoman Sonja Garsvo suggests that it is likely to be a product midway between add-on and new machine. The strategy, therefore, would seem to be to launch the Iix as a new machine, while at the same time providing upgrade facilities for the II and Iie.



Upgrade ahead for the II.



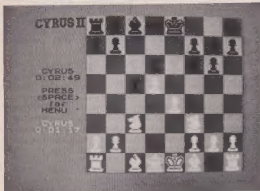
Pet is no dog, says Supersoft.

New home for unwanted Pets

SUPERSOFT has bought up the stocks of Commodore Pet computers displaced by the closedown of Commodore's Corby factory. The company now has several hundred of the machines along with large numbers of 1361 printers, and proposes to offer the equipment to both end users and dealers.

Supersoft director Peter Calver explained that the Pet still represents a large slice of the company's software turnover. "I think we're the only software house that still regards it as a serious machine." He now intends to continue software and hardware support for it "well into the 1990s".

Details from Supersoft, Winchester House, Wealdstone, Harrow, Middx HA3 7SJ. Tel: 01-861 1166.



Alligata's Spectrum Cyrus

ALLIGATA is to release a Spectrum version of Intelligent Software's *Cyrus II Chess* program at the PCW Show. The program will cost £11.95 and will feature nine skill levels, a selection of library openings, print out option, hint facility and game analysis. The first version for the 48K machine will be followed by a 128K program featuring 3D display.

Details from Alligata, 1 Orange Street, Sheffield S1 4DW (0742 755796).

Computing dictionary

COLLINS has produced a pocket dictionary of computing, the *Collins Gem Dictionary of Computing*. It contains over 200 entries accompanied by

100 diagrams and captions, and although obviously not as comprehensive as larger dictionaries has the virtue of being portable. It costs £1.95.

Details from Collins, 8 Grafton Street, London W1X 3LA (01-493 7070).

Teletext editor for the BBC

WATFORD Electronics has launched TED, a teletext editor for the BBC micros. The system consists of a 32K Rom, manual and function key strip, and can modify frames so that they can be downloaded to Prestel, or can display pages carousal style as either a "show" or a "scroll".

A scroll consists of a 600-line screen with the current display acting as a 25-line window. The show option is used to display a series of teletext screens with the tim-

ings and routings specified by the user. Shows can also be converted to scrolls for easier viewing.

The system is compatible with the BBC II and requires a single Rom socket. Price hasn't been fixed yet, but the product should be available shortly.

Details from Watford Electronics, 250 High Street, Watford WD1 2AN (0923 37774/40588).

MicroPro gains retail support

MICROPRO'S *Pocket Wordstar* and *Pocket Wordstar Deluxe* are to be sold through high street retailers WH Smith, Boots and Laskys. The packages will be available in 3 inch disc format for the Amstrad 8256, 8512 and 6128 machines. The programs will be sold alongside MicroPro's other *Pocket* products, which include *Calcstar*, *Infostar* and *Supersort*.

WH Smith is to include free hotline support for the products in their price.

Details from MicroPro International, 28/31 High Street, Wimbledon Village, London SW19 5BY. Tel: 01-879 1122.

Modem offer from Tandata

TANDATA is currently running a special offer allowing schools to buy its Tm512 range and Tm602 triple

speed modem at reduced prices. The Tm512TP was the subject of the Department of Trade and Industry's "modems for schools" initiative, and is now available to educational establishments for £159.

Details from Tandata Marketing, Albert Road North, Malvern, Worcs WR14 2TL (06845 68421).

Video stock control

VIDEOFILE is an Amstrad PCW program designed for video library managers. It can control issue and return of tapes, list tapes and members, and twin drive versions can hold lists of over 9,300 entries. It costs £79.95.

Details from SP Electronics, 48 Linby Road, Hucknall, Nottingham (0602 640377).

Handbook for communications

THE NATIONAL Computing Centre has issued the third volume in its series of interconnecting applications handbooks. The new handbook, *Links to On-Line Databases and Electronic Mail Systems*, gives details on UK and European hosts and costs £45 plus £2.30 postage and packing.

Details from The National Computing Centre, Oxford Road, Manchester M1 7ED. Tel: 061-228 6333.

Diary Dates

SEPTEMBER

3-7 September

Personal Computer World Show

Olympia, London
Details: Software and hardware for home, educational and business computer users.
Price: £2.

Organiser: Monitool, 01-467 5631.

12-14 September 8th Official Commodore Computer Show

UMIST, Manchester
Details: A wide range of Commodore hardware, software and peripherals.
Price: £3 adults, £2 children, £1 discount for advance booking.

Organiser: Database Exhibitions, 061-456 8835.

26-28 September Electron and BBC Micro User Show

UMIST, Manchester
Details: Software, hardware and peripherals for BBC machines.
Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Exhibitions, 061-456 8835.

OCTOBER

3-5 October

The Amstrad Computer Show

Novotel, London

Details: Home and business software and hardware for the Amstrad range.
Price: £3 adults, £2 children, £1 discount for advance booking.

Organiser: Database Exhibitions, 061-456 8835.

30-31 October

Hampshire Computer Fair

Guildhall, Southampton
Details: Business computers.
Price: Free entry by business registration.

Organiser: Testwood Exhibitions, 0703 31557.

NOVEMBER

7-9 November

Electron and BBC Micro User Show

New Horticultural Hall, Greycoat Street, London SW1
Details: Hardware, software and peripherals for the Electron, BBC micro and Master series.
Prices: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Exhibitions, 061-456 8835.

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. Popular Computing Weekly cannot accept responsibility for any alterations to show arrangements made by the organiser.

New
Generation
Software

ARCANA

Joystick required.
Commodore 64/128

£8.95

Arcana, the Castle of Mysteries, holds the Dark Chronicle, the most powerful Black Magic book ever known.

Aladar, the hero of the game, comes from the Land of Bright Elus. His quest is to find the Dark Chronicle and destroy it before its terrible knowledge falls into the hands of the evil King Valarequil.

The smooth scrolling passages of Arcana are joyfully protected by all manner of horrifying creatures which he must repel with his magic balls of lightning.

There are 30 finely detailed rooms with many secrets for our hero to discover. He needs 7 talismans to defeat the 7 demons that guard the book, then he must destroy it before his sinister writings are revealed to Valarequil!

PLEASE RUSH ME ARCANIA FOR MY COMMODORE 64/128

Name _____
Address _____

Please make cheques and postal orders to Virgin Games Limited and pay to the address below.
Virgin Games Ltd 2, A Verne Yard,
115 Portobello Road,
London W11 1DQ.
Available for Commodore 64/128 only.

New
Generation
Software

Popular Defence

In reply to Simon Mills' letter criticising my recent Ziggurat article I must confess that he is correct when he says that I am short-sighted and confused. I have been short-sighted since I was 12 years old and confused since I read his letter.

For newcomers to the debate, my article suggested that it was time that Basic was radically improved to match the recent advances in computer hardware and to meet the increased expectations of the discerning consumer. Mr Mills claims that enhancements to Basic would be "disturbing" and he particularly objects to the possibility that Basic might one day cope with *Manic Miner* type programs.

I am pleased that my article has led to some positive debate, although the opening remarks of Mr Mills' letter were particularly uncalled for. Perhaps I can allay some concern by expanding briefly on the parts of the article which Mr Mills found most offensive.

The Basic found on most home computers is unstructured and slow and therefore unsuitable for large, complex or fast applications. However, the language is easy to learn, easy to debug and is familiar to the vast majority of home computer users. Pascal, Ada and Cobol do not

share these advantages. It is therefore a sensible place to start from when designing the languages of the future.

Who wants *Manic Miner* type games written in fast Basic? The vast majority of *Popular Computing Weekly* readers, judging by the comprehensive survey published recently. No doubt the games would be inferior to those that machine code writers produce, but they would give individuals the satisfaction of writing their own games instead of playing other people's and allow computer users to be creative rather than submissive. A modest rather than a disturbing development, I would have thought.

Mr Mills would have us all struggling with *Gotos* and *Gosubs* on the transputers of the next century. Is that what most *Popular* readers want?

Mike Lloyd
Gloucester

Plugging Away

My best advice to I J Mackie (Letters, July 31), regarding his 9V Oric transformer, is to buy a Spectrum transformer, cut off the plug leading to the micro and rewire in reverse, i.e. the white wire to the outer terminal. You can buy the plugs from most electrical shops.

A C Symonds
Hereford

Amstraders Unite!

Having recently had to give up work to care for a disabled parent, I now find myself with quite a bit of idle time on my hands. To fill this time I would like to start a club for Amstrad CPC computer users.

For a very minimal subscription fee to cover costs, I would be willing to put together, edit, and circulate a monthly (or bi-monthly with help) newsletter, containing input from the subscribers in the form of news, views, reviews, listings—anything, in fact, to do with computing.

My aim would be to publish everything short of bad taste or libel, and part of the newsletter would be set aside as a soap-box for discussion and debate on matters trivial or profound.

Also, with enough input, I would hope to be able to build up and distribute a free software library of member's programs.

There must be oodles of nearly-good, unpublished programs out there that haven't been seen by anybody other than discerning editors and glassy-eyed parents. You never know, we might come up with a masterpiece between us.

So, come on Amstraders! Let's get together and show the professionals that we're

nearly as good as them, and probably twice as daft.

If you are even the teeny-weensiest bit interested, drop a line and a stamp to the above address, and I'll get back to you.

Jeff Walker
75 Greatfields Drive
Hillingdon
Uxbridge
Middlesex
UB8 3QN

Basic morality in basic

Mike Lloyd's article on the way forward for micro makers (Ziggurat, July 17) has been ridiculed by S J Mills (Letters, July 31), but I feel I must put all that has been said into perspective.

The article gave people a view of how their hobby will develop in the future and contained valid points on the retention of Basic.

For home use people will buy software on its merits, not the language it was programmed in.

However, we were informed by Simon Mills that the computer industry takes on few Basic programmers. This may be true, but the fact is that companies do not want self-taught programmers with knowledge of Pascal or Cobol, but they may well have no conception of a commercial environment.

continued page 9

Puzzle

Answer to Puzzle No. 216

Answer: There are 5561 different ways of drawing four cards from a pack of 38. Of these, 5993 can be arranged into a multiple of seven and 578 cannot. This represents a slightly better than 91 percent chance of success.

The program generates all of the draws possible with four cards out of thirty-six. These are lodged first in the array Z(4). For each set of four cards there are 24 possible arrangements. These are listed in the Data lines of the program and are called in turn. The array Z(4) is then transferred to array Y(4) in

the order determined by the Data statement. The resulting value is then tested for divisibility by 7. A flag (FL) is set to 1 if this is possible. If this can be done in at least one way then the 'win' variable is incremented. Note that the variable is only incremented once for each set of four cards, even though more than one different arrangement may result in a multiple of seven. This is because the question asks for the probability on the draw of the cards and not simply the number of arrangements possible.

Puzzle No. 221

Take an ordinary chessboard and place a penny coin on each of the 64 squares. The coins should all be heads upmost. Now place the queen from a chess set on top of the coin on the top left-hand square.

Next, turn over the coins which lie on all squares which are 'attacked' by the queen, but not counting the square on which the queen is standing. Finally, remove the queen. If, and only if, the coin on which it is standing

is showing heads (which on this first square it is), then turn this coin over also.

Then move the queen along the row to the next square, and repeat the whole procedure — but remember the coin on which the queen now rests is tail upmost so this coin will not be turned when the queen is lifted. Continue along the row in this way, and then after reaching the end of the row move down to the next row, starting again on the left and moving a square at a time to the right.

In this way move over the entire board of 64 squares until finishing at the bottom right-hand corner.

At the end of the entire operation, what is the final 'pattern' of heads and tails left showing on the board?

Winner of Puzzle No. 216

The winner this week is P Story of Ingham, Ross-on-Wye, who will be receiving £10.

Rules

The closing date for Puzzle No. 221 is September 9.

```

10 DIM Z(4),Y(4)
20 DIM S(4)
30 DIM A(4)
40 DIM B(4)
50 DIM C(4)
60 DIM D(4)
70 DIM E(4)
80 DIM F(4)
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260 DIM X(4)
270 DIM Y(4)
280 DIM Z(4)
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With the removal of the industrial factor from the choice of language, free choice must prevail. Basic suits the needs of most programmers; therefore, condemnation of the language and, in turn, its users seems pointless.

The moral is, let the micro industry develop and don't cloud it with uneducated statements on the subject of programming.

Mark Hudson
Ipswich

Betrayed by Commodore

I have a faulty Commodore 128, and I have been waiting three months, for Vic Odds, my dealer, to get a new C128 in to exchange it. Now I have been told by Vic Odds that there would be no more 128s. This prompted me to ring *Popular Computing Weekly* three weeks ago explaining my predicament.

I also phoned Commodore

at Corby, and spoke to someone in the marketing department, who assured me that there were no supply difficulties and that they were not discontinuing the C128.

I now feel very upset and betrayed by Commodore. I've had a Vic 20, Commodore 64 and Commodore 128, so you can see I've been loyal to the Commodore range.

I feel that had the C128 been supported in the way that the Amiga has – for instance the amount of space and promotion devoted to the Amiga at the recent Commodore show at Novotel – then the history of the C128 would be very different.

There seems to have been a recent succession of Commodore machines that do not last very long – the C16, Plus/4.

If they carry on letting their machines die in such a short space of time, people are going to feel apprehensive about buying the Commodores.

Miss Gemma Hewitt
Sydenham
London

After Kasparov v Karpov

This is your first move in the game between you and Colossus 4 Chess. As you can see from the diagram, you have the chance to play in both of the games below.

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You play Black in game one and White in game two. Please send your next move for each game, ie, the moves marked ? in the diagram, on a postcard or stuck-down envelope, to *Popular Chess*, Unit 11, South Bridge, The Millings, Sawbridgeworth, Herts CM21 9PG. Your move must reach us by August 28. No correspondence concerning your moves can be entered into.

| Game 1 | Game 2 |
|-------------|-------------|
| White Black | White Black |
| 1 P a2e4 ? | ? |

The most popular move suggested by entrants will be entered into the game, and Colossus will then make its reply.

The next moves will be printed on the Letters page in two weeks' time, with reports on the game's progress in our monthly chess column.

And please bear with us while we go through the not-so-exciting opening stages of the game—we'll get to the nitty-gritty of the middle game soon enough.

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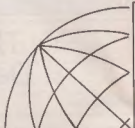
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Computers vs Humans



Martyn Bryant makes his opening move in a new regular column on computer chess

Playing chess against the computer is one of the most popular pastimes for many micro users. This new series has two different aims. Every month, we'll be bringing you an update on the latest goings-on in the computer chess world, with hints and tips, chess programming techniques and tournament reports.

In addition to that, *Popular* is running a fortnightly computer chess game, between you, the readers, and *Colossus 4 Chess*. Every other week, on the Letters page, you'll find a coupon to fill in your choice of move in the *Popular* vs *Colossus* game. By the next week, *Colossus* will have made its reply, and then it's up to you again. See this week's Letters page for full details and how to play. In our monthly columns, we'll keep you posted on the game's progress.

This week, however, we're going to look at how computer chess has developed over the years.

In the 1984 World Championships, after a program (which will remain nameless) made its umpteenth bad move, the programmer concerned was overheard to say that his program wasn't based on "artificial intelligence" but on "artificial stupidity".

If you look around the chess programs that are suitable today, from the cheapest micro to the mightiest super-computer, it is often easy to understand the programmer's frustration. Although computer chess has made giant leaps since its birth in 1950, we are probably still several decades away from a computer becoming world champion and if it did it couldn't hold a conversation with Wogan as Gary Kasparov almost managed!

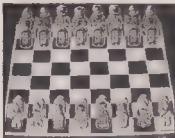
But is this fair to the programs? Of course not (but then I'm biased). Computer chess is only 36 years old, whereas chess has been played by humans for many hundreds of years. The wealth of chess literature is mountainous and analyses of games played hundreds of years ago are still in print today. The human "software" library is awesome.

"Computers can play better than 99% of the world's human players"

Programmable computers have only been around about 40 years, but the human brain (our "hardware") has been million of years evolving. Of course it's difficult to compare computer chess directly with human chess because of the completely different "software/hardware" used.

A computer program consists of tens of thousands of binary numbers which would be meaningless to a human. But can a computer read a chess book? Even if it was capable of character recognition, could it then "understand" the language? And even then could it apply that knowledge to an actual game? Certainly not yet.

A computer processor can execute several millions of instructions a second, but unfortunately it does this serially.



Computer chess

The human brain's synapses fire in milliseconds, but the brain has literally billions of connections which can fire independently, thus making the processing power of our brains far greater than all the multi-million pound super-computers of today put together.

How then can computers play better than 99% of the world's human players? Firstly, because 90% of the human players are pretty bad anyway. The top 10% or less are the hobbyists, club players, masters, grandmasters, etc. who take their game seriously. However, even now the best programs are, in

certain cases and some aspects of the game, playing master level chess.

Secondly, the computers use totally different methods of picking the "best move" from those used by us humans. They use systems like minimax-tree-searching, move-generators, alpha-beta-pruning, evaluation-functions, etc.

Although any human can understand how these algorithms work, we could not possibly use them to play chess ourselves because of their serial nature. They were designed for computers to use and have been refined and added to over the years and now the "computer-thought" way of playing chess can challenge all but the very best "human-thought" players.

All this has been achieved in a few decades by the endless dedication of perhaps only a hundred or so addict programmers. If millions of programmers had studied the task for hundreds of years then computer chess programs would surely be unbeatable.

When can we expect a computer to beat the human world champion, thought? In the 1960s, the top chess programmers were just as unsure as they are today. Estimates ranged from a "few years" to "many decades" and they still do.

Martyn Bryant is the programmer of *Colossus 4 Chess*.

Martyn Bryant welcomes any comments, queries or correspondence from readers. You can write to him at Unit 11 South Block, Riverside Way, The Maltings, Sawbridgeworth, Herts, CM21 9PG.

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The Bondwell 34: the PC war begins

"To produce a PC all you need is CPU, O/S and BIOS, a bag of Ram chips, sundry connectors and bits like disc drives and power supply and you're away." John Lettice reports on the newest PC

Technically there's nothing particularly remarkable about the Bondwell PC, just as there was nothing remarkable about the IBM PC when it was launched a few years back. But, like it or not, the IBM has to all intents and purposes taken over the business micro world, and as its imitators, hotly pursued by IBM itself, come down in price the IBM standard is shaping up to expand down into the home and small business markets.

The Bondwell, at £890 for 640K twin 360K disc system, is one of the first signs that this is happening - Opus, Amstrad and sundry others will follow in September, and we could see a full-blown PC war erupting this Autumn.

The success of the PC standard is often ascribed to IBM's name, but although this has obviously helped the PC's design is equally important.

In terms of format an IBM standard PC is a largely empty box with space inside to house two disc drives (hard or floppy) and anything from five to seven standard expansion cards that can house extra memory and most - sometimes even all - of the machine's I/O. End users can therefore tailor systems to their own requirements, adding Ram, serial and parallel interfaces and high resolution/colour monitor cards as they please.

The internals have a similarly plug in respect to them. The machine is built around an Intel CPU of the 8086 series. The original PC used the 8088, while the faster compatible machines use the 8086, and the AT, IBM's follow-up to the PC, uses the 80286, IBM doesn't own the rights to these chips, so they can all be bought off the shelf.

The BIOS (Basic Input/Output System) is proprietary to IBM, and insofar as the box has any personality this is where it resides. The machine's operating system is however loaded in from disc, so the BIOS isn't complicated, and numerous companies have been able to produce compatible versions without infringing IBM's copyright.

The operating system, MSDOS, can be bought in from Microsoft, so to

produce a PC all you need is CPU, O/S and BIOS, a bag of Ram chips, sundry connectors and bits like disc drives and power supply and you're away.

This is exactly what manufacturers in Korea, Taiwan, Singapore and Hong Kong have been doing for some time now, and while the Bondwell isn't the first of these to appear in this country it's currently one of the cheapest.

The Bondwell box is one of the more basic of the genre, particularly close to MSX Basic, major differences being screen-related commands. Sound is however the same, although IBM look-alikes only use one channel.

Other software is liable to be a problem in the short term, as IBM programs are traditionally priced high, but the arrival of the Amstrad PC plus a bit of judicious bandwagon climbing by the software houses should bring the cost down to more affordable levels.

In some ways the dominance of the IBM PC worldwide is depressing. It's bulky, low-tech and the screen handling

messy to say the least. It's not the machine the gods ought to have chosen to rule the world, but they have, the software's there, and there are enough people out there working on the PC standard to make it an effective business tool, as opposed to an end in itself.

The original product from IBM has the additional problem of being grossly overpriced, and here we come to the upside. Companies like Bondwell are proving that it costs no more to produce a high-spec business machine than it does a home one, and companies like Amstrad, Spectrum and Opus are starting to pass these savings - to the consumer, and the logical conclusion of the machine's entry into the mass market will be better and cheaper software. And that certainly will be good news.

Hardware Bondwell 34 Price £890
Supplier Spectrum Group, Hunting Gate, Hitchin, Herts SG4 0TJ (0462 37171)

Nucleon: only the idea was sound

Nucleon, from French company Pyramide, is supposed to be an all in one programmers aid covering graphics, character set design, windows and sound.

The problem is that those who really can program won't need the facilities offered here and those who can't program need more. So, who is the package actually aimed at then? Well, presumably, it's the person who knows their way around the QL pretty well without being in the new professional class. Unfortunately, this person will know enough so that *Nucleon* offers nothing new, especially as it is largely programmed

in Basic.

The Compact draw program enables you to create drawings which are then turned into basic commands, for incorporation into your own programs, thus saving considerably on the 32K nor-

mal design of course. ■ of potentially much more use although the method of actually designing said characters is somewhat tortuous.

Windows lets you design your own viewpoints on life but again the level of pro-

gramming is not highly sophisticated. Maestro lets you get away from the QL's *Beep* command and provides a method of writing little tunes painlessly. If you're no great shakes musically then Maestro should help you to churn out some-

thing reasonable. Even so, with only one channel and two octaves to play with no matter how hard you try the finished product will never resemble the sort of music produced by Commodore 64 games.

Nucleon is trying to be all things to everyone but in fact is only a few things to a very few people.

♦♦

Duncan Evans

"Nucleon is for the person who knows their way around"

mally needed for a saved screen. The theory sounds fine, what it boils down to though is fairly crude line drawings which the programmer could probably write anyway.

The Characters program, which deals with character

gramming is not highly sophisticated.

Maestro lets you get away from the QL's *Beep* command and provides a method of writing little tunes painlessly. If you're no great shakes musically then Maestro should help you to churn out some-

Program Nucleon Price £19.95 Micro QL Supplier Pyramide, c/o Rao Promotions, 28 Waverley Grove, London N3.

A friendly word on Tasword and Tasprint

Releasing a new word processor for the PCW machines is a bold move even when the program in question is very cheap and also successful on other machines. What features are there available with *Tasword 8000* that would attract users away from *Locoscript*?

Firstly, *Tasword* is a remark-

ably easy program to get to grips with – the help menus are so self evident and extensive and the options available so straight-forward that there is almost no need to refer to the manual at all.

This is not to suggest it is unsophisticated. Indeed, it is an improvement on the *Tasword* releases to date – it is

faster and has some welcome additions – you can embed markers in the text for example to help you move around quickly, merge files at the cursor position, and the find/replace is vastly improved.

The display is completely 'what you see is what you get' and *Tasword* has also pioneered whereby you can use the arrow keys to get anywhere you like on the page to begin typing – just

lity available. ■ is also invaluable for editing and re-formatting any ASCII files you may have created by transferring data down a modem or between different utilities.

A quite sophisticated mail merge option is capable of making tests on the data supplied to decide what to print. The only feature this lacks is the ability to re-format the text prior to printing meaning that a ragged right edge is inevitable.

Perhaps its greatest strength is the fact that the Ram of the M drive is used by the program for directly storing the text as you type it. Very large files can thus be created, about 100K on the 8255 and over 300K on the 8512. Because text is held in Ram moving around large files and making changes is very very much faster than with *Locoscript* or any other word processor I know.

Tasprint 8000 supplies another six fonts that can be used with *Tasword*, directly with an ASCII file or via a sort of direct 'typewriter' option.

Tony Kendle

"Locoscript has many excellent features"

like a pen and paper. It's a small point but impossible on most word processors and a very friendly feature for beginners.

Locoscript has many excellent features – templates, embedded format rulers, multiple block storage, alternate header/footers, etc – but *Tasword* can challenge these with a word count, four notepads for jotting reminders, an extensive scientific/foreign character set and two extra fancy fonts supplied for printing.

Tasword works with pure ASCII text which makes it suitable as an editor for program listings, etc, and at least readable by almost any other uti-



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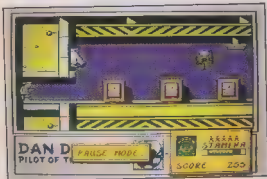
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Dan Dare: The reincarnation



A last! A licensing deal that lives up to the standards of the original. After the rubbish that James Bond and Superman received at the hands of software producers, it's nice to see Virgin doing old Dan Dare proud.

I don't recall seeing better graphics on the Spectrum, and the Commodore and Amstrad graphics are up there with the best. Dan looks like the Dan we know and love, the Mekon looks suitably evil, and the animation of all parties is flawless. All versions feature authentic comic-book

style captions and running commentaries at the foot of the screen.

And the background graphics are terrific – solid, multi-colour backdrops with metallic-looking girders and pipes, gravity lifts with moving indicators and blinking lights, and walls and cells which Dan runs in front of, and behind, with, on the Spectrum, not an attribute problem in sight.

The sound on the Spectrum is confined to the deadly sound of laser fire, but the capabilities of the other two machines are used to good effect.

The scenario is classic Dan Dare. The Mekon has launched a hollow asteroid at the Earth, and Dan has only two hours to destroy it.

He (you) does this by finding control keys for a self-destruct device hidden in various locations. Find all five keys, get off the rock in time, and it's party time on planet Earth.

Fail and... well, when did Dan Dare ever fail?

Of course it's no stroll in the

trifles like these, he can be knocked out and transported to a prison cell which costs ten precious minutes – and the clock is ticking away in real time.

Full marks to Virgin for this one. The production is superb and it's tough enough to keep you playing for weeks.

Dan Dare deserves an immediate Number One spot.

Popular Appeal: ★★★★★

Peter Worlock

Above left: *Dan Dare*, the Amstrad version. Right: *Dan Dare* on the Spectrum. All versions to be released in September.



park. Apart from ceiling-mounted laser batteries, and even trickier kneecapping devices, there are squads of patrolling Treens to be dealt with.

Although Dan is too tough to be killed by piffing little

Program Dan Dare Micro
Spectrum 48/128, Amstrad CPC, Commodore 64/128 **Price** £9.95
Supplier Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11.

Leaderboard scores above par

The C64 *Leaderboard* was a pretty good game but suffered with the unrealistic setting of islands in the middle of a lake – hardly Wentworth! The ST version corrects these faults and provides an almost perfect game by incorporating hazards such as rough,

end of a joystick plug, which you must insert into joystick port two before the start of play or the system throws a wobbly and resets itself.

After all the pre-match preparations have been done, it's out on the course you go to face the first hole. Once you've selected which club

ible faults with the game. One is the occasional flickering around the edge of the golfer as he plays a shot and the other is the hefty price tag of £40. However, niggling aside, *Leaderboard* is a truly superb game, the best to appear for the ST so far.

Popular Appeal: ★★★★★

June Pidgeon

Program Leaderboard Micro Atari ST **Price** £39.95 **Supplier** Slicka Shop, 1-4 The Mews, Hatherly Road, Sidcup, Kent DA14 4DX.

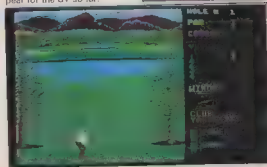
"Leaderboard is a truly superb game, the best to appear for the ST so far"

bunkers, water and nicely drawn trees into a realistic golf course (although it's pretty flat except for the green).

The first hazard of the game, though, is the dangle, represented by the mutilated

you're going to use, and lined up the shot, it's the moment of truth on the power/snap indicator, where you attempt to avoid slicing or hooking the ball.

There are only two discern-



When crime doesn't play

After several hours play and no points scored, it became apparent that *Miami Vice* is more a problem of genetic engineering than of game playing. Assuming that humans – or at least the nearest to humans *Popular* could find – can't handle it, and that it will take several billion years for natural selection to produce the sort of hairy-palmed, slaving loon that can, building your own is the only logical solution.

Even as I write a semi house-trained part-Vulcan Battle Droid is driving alone through the streets of Miami in search of Mr. Big, but there seems little hope of success, the game's script being infinitely easier to grasp than the game itself. The object is to bust the perpetrators of a major drugs deal which is, as they say, going down. Or that's what the word on the street is saying at any rate.

To do this you drive from

bar to bar, dodging innocent civilian cars – which seem to have about as much road sense as the average digestive biscuit – busting small time hoods to amass evidence.

Your precinct captain has thoughtfully provided you with a schedule of meetings, so if for example you wish to arrest Sharky, you know he'll be at Vines Bar at 1.20pm. Or 8.40pm, 7pm or 4.20pm... Yes, that's right, there are several lists. If you catch a villain you, of course, know which is the correct list, and, can therefore, theoretically roll up the rest of the mob... theoretically.

The meet is your next problem. Every second in real time is a minute in the game, and to catch a crook you have to arrive between four and eight seconds after the meeting starts. So you have to drive up, park without getting shunted by one of the digestive biscuit brains, get out of



the car without catching your trendy jacket in the door, and get into the bar within that four seconds. The fact that the *Popular Battle Droid* has now managed this several times I'd regard as a tribute to the perfectability of humanity.

Assuming you have managed to pick up crooks or evidence you then have to brave the traffic (see biscuit brains, above) to take them back to City Hall. So far none at *Popular* has got as far as a second bust. But it seems to be possible, and I'm now inclined to agree with Ocean that it is very difficult, but is nevertheless playable; just.

You'll need a lot of perseverance to get to grips with this game and you might well find it so frustrating after the first couple of hours that you put it aside and never go back. But if you set aside enough time to get into it, it'll probably repay you with hours of entertainment.

Popular Appeal ♦♦♦♦
John Lettice

Program Miami Vice Micro Commodore 64/128
Price £8.95 **Supplier** Ocean Software, Ocean House, 11 Central Street, Manchester M2 5NS.

Mindstone classic

Mindstone is a beautifully-presented graphic adventure set in the traditional mould, complete with dwarves, princes, spells, magic rings and all the usual monsters. Your party of four, led by Prince Kyle, consists of the usual cross-section of rabble, each of which has varying Strength, Psyche power and so on.

As in most adventures, play consists of exploring the locations, picking up objects and using them in the required way. Most of the puzzles aren't too taxing; for example, your way is blocked at one point by an Ice Wall, and you may have picked up a Fireball spell elsewhere – there is a bar of Lead to be found, and also an Alchemy spell.

The programming, by John Pitcher, is impeccable, from the unique loading screen onward (apart from two mistakes, one a spelling error

early on, and the other much more serious, see later).

The adventure is menu-driven, with no text input, though control of the program may be chosen by the player; the faster way is to use the keyboard, on which certain keys are assigned to certain commands (E = Eat for example). You may also play with the joystick with icons; it is rather neat, and although the icons are a lot slower I found that the program crashed every time I used the keyboard method.

Mindstone is a minor classic and I look forward to sequels (Hint, Hint, Edgel)

Popular Appeal ♦♦♦♦
Tony Bridge

Program Mindstone Micro Spectrum **Price** £9.95 **Supplier** The Edge, 36-38 Southampton Street, London WC2E 7HE.

Cauldrons too

Super fun this one: sequel to the impressive *Cauldron*, and anything even more challenging and rib-tickling. In *Cauldron* you controlled a witch, flying around a planetoid collecting keys and fighting the Pumpkin King. In *Cauldron Two*, you, yes, you, are that very Pumpkin King! Zowie! The pumpkin is completely legless (no, I don't mean it's been at the magic potion), so it has to bounce around the castle under joystick control.

Your quest is to find the magic objects which will allow you to defeat the Queen of the Witches, overcoming the various skeletons, bats, ogres, magic weapons and fires which will deplete your magical energy should you encounter them. If you can find a magic spark, you can use it as a weapon, zapping your adversaries by pressing the fire button and controlling

the spark with the joystick. Otherwise, your only hope is to bounce over the baddies, controlling the height of your bounce carefully to avoid jumping out of one scene into another.

Each time you lose a life the witch queen, depicted at the top of the screen, gives a convincing cackle which should spur you on to greater efforts to defeat her. Great music by Richard Joseph, and the usual top-class design and programming from Steve Brown and Richard Leinfellner, add up to a superior entertainment for your Amstrad.

Popular Appeal ♦♦♦♦
Chris Jenkins

Program Cauldron Two Micro Amstrad CPC 464/664 **Price** £8.99 **Supplier** Palace Software, 275 Pentonville Road, London N1.

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Give your cat more than nine lives

A fistful of pokes from Tony Kendle this week, for *Quazatron*, *Match Point*, *Pyramide's 3D Wanderer* and *Ghosts and Goblins*



This week we are going to continue in *Popular's* fine tradition of supporting minority micros, as long as there are enough interested owners to help us do so, by printing another welcome letter from an old friend, Allan Jarvis of Benliffe, who some time ago sent in some pokes for the QL game EVA.

Allan begins by saying, "I must disagree with the good review you gave the QL game *3D Slime* which in my opinion is too slow, being written in Basic and compiled with the *Supercharge* compiler."

"I found the game charming and quite addictive - my own feeling is that technical wizardry is far less important than a good game design"

You have a point about the game's speed, Allan, but I still found it charming and quite addictive - my own feeling is that technical wizardry is far less important than a good game design. Some of my very favourite releases are both quite old and very simple and make even *3D Slime* look like something running on the Amiga but they can be just as gripping as when first released.

Anyway, the letter continues, "A much better game is *3D Wanderer* by the French company Pyramide. The three-dimensional graphics are stunning. Given all the reported remarks about the problems with screen handling on the QL it is amazing that they are so quick. After playing the game for about a month and only getting to ability level five, I decided to look for a chat routine so that I could try the black holes, meet the sphinx and finish the game."

"I discovered the following pokes which allow the number of shields, energy level, number of cats (sic), and ability level to be set before the game starts. Load the Boot program and add the following lines:

```
80 a=RESPIC)
82 POKE-L 885+a, 0
84 POKE-L 885+a, 1
95 REMark set shields 0-255
96 POKE 883+a, 255
```

```
REM Mark set energy 0-31000
REM POKE-W 898+a, 31000
99 REMark set cats 0-8000
90 POKE-W 1847a+a, 8000
91 REMark set ability 0-10
92 POKE 18478+a, 10
```

"The program can then be run or re-saved to your backup cartridge."

"Another fantastic program is the QL version of Peion's tennis game *Match Point*. It is possible to cheat however - try pressing the function keys in one player mode before you serve."

Thanks for the letter Allan, look forward to the next one

Moving now to the Spectrum, we've had a letter from Andrew Brown writing about the excellent game *Quazatron*.

from Hewson Consultants. *Quazatron*, of course, is the game that looks like a cross between *Spindizzy* and Hewson's Commodore release *Paradroid*.

Andrew writes, "This program makes your droid completely indestructible, ie. you cannot die and you cannot lose your extra parts. Simply type in and run the following and follow the on-screen instructions."

```
5 REM Quazatron Pokes by ABR
10 CLEAR 2563: FOR N=23296 TO 23320: READ
A: POKE N+A, NEXT N
15 PRINT TAB 8: "PLAY QUAZATRON TAPE":
LOAD: "" CODE
340 RANDOMISE USR 23296
100 DATA 23,9,9,1,34,116,133,195,10,133,
205,88,5,33,220,224,34,99,228,62,195,
50,98,228,225,233
```

To finish off this week I can just squeeze in a tip for Commodore owners who have both *Elite's Ghosts and Goblins* and a reset switch. The tip comes from Ronnie Farrington of Bidston:

"Load the game, reset and type *Poke 2358, 141 (Return)* to get unlimited lives. To run the game type *Sys 2128*."

Charts

Top Twenty

- 1 (2) Speed King
- 2 (1) Dragon's Lair
- 3 (15) Thrust
- 4 (8) Ninja Master
- 5 (7) ACE
- 6 (4) Ghosts and Goblins
- 7 (3) Green Beret
- 8 (10) Kick Start
- 9 (5) Leaderboard
- 10 (11) Molecule Man
- 11 (19) Kane
- 12 (13) Jack the Nipper
- 13 (14) Formula One Simulator
- 14 (18) Knight Tyme
- 15 (-) Spellbound
- 16 (6) Video Olympics
- 17 (12) Kung Fu Master
- 18 (9) One Man and his Droid
- 19 (-) Stainless Steel
- 20 (16) Knight Games

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Bulbo Biggun and Bimbo Faggins in The Boggit

Tony Bridge compares McNeill's and Wilson's variations on a theme



It seems many years ago now that Thorin started to bore the pants off me with *the* that singing about Gold (and I always expected rather more to come of it, thinking that here was a major clue to the rest of the game, alas, it was not to be). Now, along comes his cousin, Thorny, and he has a song of his own.

"Gold, it is a yellow metal/more nicer than copper or brass/A Dragon pinched mine but I'll settle/with kicking him up the..." This is where the censor catches up with Fergus McNeill and CRL/Delta 4.

I never cease to be amazed at what can be achieved with *The Quill*, but one ingredient that must be supplied by the author is imagination. Without this, *The Quill* becomes a boring utility which produces sausages - but there's no chance of that with the two adventures we're looking at this week.

Philip Mitchell's watershed adventure, *The Hobbit*, has been ripe for a parody and at this moment Fergus McNeill is one of the few writers with the courage (and talent) to undertake this task - although John Wilson, whose name appears regularly in this column and others (and who must thank for his help in many adventures, some of which I would have given up on) recently sent me a very good effort of his own, also Quill'd and also called *The Boggit*.

The two versions approach the parody from different directions. John attempts to evoke the atmosphere of Tolkien's book as well as the game (and does a good job, considering the shortcomings of the medium, despite falling to the temptation of the occasional McNeill-ism such as Grand Alf's Denim jumpsuit and Nike trainers. Fergus is content to take the game itself apart and reconstruct in his unique way, creating a typically lunatic world.

I'm glad to be able to report that in CRL's 3-part story, you'll find no CSs (although there is an Australian heavy orc band), and the jokes mostly stay this side of the taste barrier. As usual, Fergus has used his Quill with the usual sickening and mind (mine) - numbing ease - he started to really get to grips with the utility round about the time of *The Joy-stick* series (and I haven't seen this

epic saga, do yourself a big favour and rummage through the bargain bins or even contact Delta 4 direct [Room 101, The Shelling, New Road, Swanmore, Hants SO3 2PE]. Certainly no-one has done so much with the program.

The pictures adorning *The Boggit*, *Bored Too* are pretty faithful reproductions of those in the original (though there is the usual *Graphics On/Off* facility available) and speaking of pictures, there is also on the cover the by-now obligatory parody of the "Map of the Fantasy Land" (Wilberland in this case). But it is the text that makes *The Boggit* a classic and the best Delta 4 adventure yet.

"The Boggit is set to become a classic adventure"

Splitting the adventure into three parts has allowed McNeill to write ream after ream of craziness, with adventuring in-jokes galore. All this is very attractively laid-out, with a very legible, vaguely Middle Earthian character set and lots of colour. *The Patch* is used to some extent, allowing Ram save and load - there isn't much sound, although the sequence I mentioned earlier, of Grandalf's gift, seems to have been contrived mainly because there was a nice explosion effect lying around somewhere!

Thankfully, also to be found are all the lovable McNeill spelling mistakes (a Delta 4 story wouldn't be the same without 'em). Along with the three parts of *The Boggit*, the tape from CRL includes *Sceptical Part Two*. For those who missed Part One, this is Delta 4's answer to Micronet and includes some very strange pages of chat.

This is the way most of the story continues; the usual location description, followed by several screens of typical Delta 4 humour. There are several objects lying around, but you must beware of using them in the wrong situation, as some from the first part must be carried over to the second. This is the only drawback with a multi-part story, of course; if you find that you need an

object from the previous section, then you must re-load the whole part. It's rather easy to progress through the first part in particular without coming up against an impassable situation, and all too easy (though a subtle warning is given) to stumble into the second part with no return possible, short of re-loading (and even saving - Ram won't help you back out here). The tough puzzles start in the second part, and, I'm reliably informed, only get harder.

The Boggit is that rarity, a parody that surpasses the object of its parody. Set to become a classic, it demands a place in the collection of any self-respecting adventurer.

Just about most of whom will have a version of the original adventure, *Colossal Cave*. Or at least, what we have always assumed was the original - those resourceful people at St Bride's School for Gentlemen have unearthed the real original, known, of course, as *The Very Big Cave Adventure*.

Again, it is Quill'd, Patched, and Illustrated, and you will know by now that the St Bridians are also masters (mistresses?) of their art. I've enthused for so long about CRL's other offering this week, that there's really not enough space left to do justice to this second parody, but that's not because it isn't as worthy of our attention. Again, it is a multi-parter (two parts in this case), but the location descriptions are generally not so locuquacious as *The Boggit*.

You don't have to know the original game in order to enjoy this one. There are many frustrating puzzles to be enjoyed and plenty of locations to be explored (there's even a Space Invaders Room, where you play the game in text!), and plenty of objects to pick up. Some of these may be thrown at you though, unlike the original, it's not a bearded dwarf, but rather a ginger-haired dwarf. *The Quill* is used well, and *Patch* offers Ram saves as well as a few sound and visual effects. CRL are packaging these adventures well, and the quality is maintained even on the loading screens, which are very attractive.

I enjoyed playing *Very Big Cave* - it was almost like discovering the original afresh. Ah, the nostalgia of it all!

"The envelope, please . . ."

Many thanks to everyone who entered the Tolkien competition in *Popular*, July 10. We guessed *Lord of the Rings* would be an attractive prize on the Amstrad PCs, but it was interesting how much interest *The Hobbit* still generates.

Few people had much difficulty with the questions, but then they weren't intended to be too obscure.

As a checklist: the questions – and answers – were

1 Bilbo and Frodo shared a birthday. What date was it? (Answer: September 22 – reference: page 1 of *LOR*)

2 Who was "an evil thing in spider form", from whom no fly escaped? (Answer: Shelob – reference: page 751 of *LOR*)

3 In *The Hobbit*, what was the name of the dragon who had stolen Thorin's family's treasure? (Answer: Smaug – reference: page 33 of *The Hobbit*)

4 Under what name did Frodo, Pippin and Merry first meet Aragorn, son of Arathorn? (Answer: Strider – reference: page 182 of *Lord of the Rings*)

5 What did Bilbo Baggins intend to call his memoirs? (Answer: There and Back

Again: *A Hobbit's Holiday* – reference: page 284 of *The Hobbit*)

First out of the hat and the winner of the special Melbourne House hologram as well as the game was Roy Stead, of Widnes in Cheshire. Congratulations, Roy.

The nine runners-up were: Christopher Best of Plymouth; Alan Brown of Coventry; G C Burns of Gateshead, Tyne and Wear; Rhys Clement-Evans of Woolton, Liverpool; R Costen of Tunbridge Wells; Tim McElwaine of Crowthorne, Berkshire; C A Mitchell of Stafford; Colin Read of Pewsey, Wiltshire; and Geoffrey C R Williams of Birmingham.

Name that PSS sequel

Last month we invited you to name the follow-up game to PSS's *Swords & Sorcery*.

Apart from the nameless dodo who suggested *Swords & Sorcery II*, most of you attempted to be original and after

much pondering PSS has come up with the winner.

He is Jason Boydel, of Bolton, Lancs, who will get a credit on the final packaging for the game – now to be called *Heroquest*.

Free copies of the game will be going to the runners-up, who are:

■ Mitchell, of Southampton; Keith Wolstenholme, of Manchester; Neil Balfitt, of Worksop, Notts; P Shaw, of Blackpool, Lancs; D Orme, of Tipton, W Midlands; C T Harper, of West Bromwich; S A Savage, of Grinstead, Sussex; R T Blazye, of Hayes, Kent; Gavin Lennan, of Newtown Butten, Co Fermanagh; Robert Donnan, of Swanses; Roger Brittain, of Bournemouth; K Earley, of East Croydon, Surrey; Alan Jackson, of Olney, Bucks; R Tugwell, of Northampton; Andrew Sufin, of Blandford Camp, Dorset; Paul Wright, of Skelmersdale, Lancs; Tommy Tornari, of London N13; Stephen Richards, of Blairgowrie, Tayside; D M Shannon, of Newtown Abbey, Co Antrim; C T Eng, of London SW11; Alistair Lam, of Belfast; S McCanhy, of Newark, Notts; Hans Demmicks, of Berlin; and Ian Gnsby, of Colchester, Essex.

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Romans

by David Wragg

This routine incorporates two new functions *Arabic\$* and *Rom\$*.

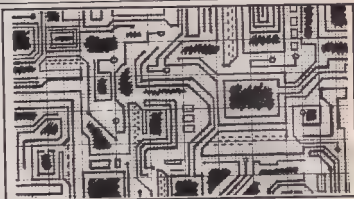
The first function will convert a string of Roman numerals into the usual numerics.

For example, *Print Arabic\$(MCMXXXIII)* gives the output 1983.

The function will report an error if the Roman numeral is not valid. It can be in either upper or lower case.

The second function is called *Rom\$* and this will naturally convert an ordinary number into a string of Roman numerals.

For example, *Print Rom\$(1986)* give the output *MCMLXXXVI*.



```

140 Define Function Rom$(rom)
150 check
160 Return roman$
170 End Define
180 Define Procedure check
190 Restore $10
200 roman$=""
210 For number=1 To 13
220 Read numeral$,value
230 Repeat loop
240 If rom=roman$ then roman$=roman$&numeral$;rom=rom-value;Else Exit loop
250 End Repeat loop
260 End For number
270 End Define
280 Define Function Arabic(roman2$)
290 roman2$=Upper$(roman2$)
300 Repeat main_loop
310 Restore $10
320 roman$=roman2$;amount=0
330 For g=1 To 7
340 Read numeral$,value
350 Repeat try
360 If Len(roman$)>0:If roman$(1)=numeral$:amount=amount+value;trim 2
370 If Len(roman$)>0:If roman$(1)<numeral$:Exit try
380 If roman$="" :Exit try
390 End Repeat try
400 Read numeral$,value
410 If value=0:Exit g
420 If Len(roman$)>2:If roman$(1 To 2)=numeral$:amount=amount+value;trim 3
430 End For g
440 roman$=amount
450 check
460 If roman$=roman2$:Exit main_loop
470 Print#0,"not a valid roman sequence":Stop
480 End Repeat main_loop
490 Return amount
500 End Define
510 Data "M",1000,"CM",900,"D",500,"CD",400,"C",100,"XC",90,"L",50,"XL",40,"X",10,"IX",9,"V",5,"IV",4,"I",1,"",0
520 Define Procedure trim (num)
530 If Len(roman$)>num:roman$=roman$(num To Len(roman$)):Else roman$=""
540 End Define

```

Space War

by Mark Ward

This week features the final part of Space War. The remainder of the instructions are as follows:

Mines (column 6 table (1))
Bombers can lay mines on the board (symbolised by an M). Any ship landing on top of a mine square at the end of its go will be destroyed. A bomber can lay a

their turn on a mine square are not destroyed. They carry special equipment that deactivates the minefield for the rest of the game.

Long Range Scanners (LRS) (column 7 table (1))

As the battle first starts all enemy ships are unidentified (symbolised by an E).

Moving any ship with long range scan-

higher energy value will beat one with a lower value when the two are involved in a battle. The two exceptions to this rule are:—

1) a scout will beat an HQ ship
2) a scout will beat an HB ship
Battle is initiated when a ship finishes its go in the same square as a ship of the enemy fleet.

Oh yes, one thing I forgot to mention.

TABLE (1)

| SHIP | SYMBOL | MOVE | HYPER-SPACE | HYPER (%) | MINES | DREDGER | L.R.S. | ENERGY |
|-------------------|--------|------|-------------|-----------|-------|---------|--------|--------|
| H.Q. Ship | | 3 | 2 | 2 | No | Yes | Yes | 7 |
| Heavy Battle Ship | | 7 | 4 | 2 | No | No | No | 6 |
| Light Battle Ship | | 3 | - | - | No | No | No | 5 |
| Bomber | | 4 | - | - | Yes | No | No | 4 |
| Cruiser | | 3 | - | - | No | No | No | 3 |
| Dredger | | 4 | - | - | No | Yes | No | 2 |
| Scout | | 7 | 7 | 2 | No | No | Yes | 1 |

mine on any square that it could reach during a normal movement go.

You only have a few mines so use them sparingly. Once they are gone there are no more.

Controls—The M key lays a mine.

Dredger (column 7 table (1))

Ships with dredger capabilities that finish

ners next to an enemy ship will identify the enemy. The long range scanners will not work if it is the enemy who moves next to you! Ships are also identified once they have been involved in a battle.

Energy (column 9 table (1))

The energy value gives the effectiveness of a ship in battle. Generally a ship with a

The enemy has already mined the battle-field with mines "invisible" to your scanners. Good luck.

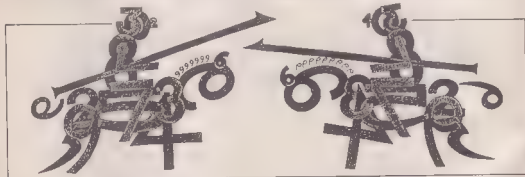
And finally, if you don't want to type it all in send £3 to Mark Ward at 43 Wordsworth Road, Hampton, Middlesex for a copy on cassette.

| | | |
|---|---|--|
| 2300JUMP=100000NEXT 2300NEXT=1 2310GOL3:1 2320P=2*(E1)=0 2330IF P=31E=1:SHX=1:MOVE930,90:PRINT# HX:1:MOVE930,90:PRINT#HX 2340IF P=30E=30E:SHX=1:MOVE930,50:PR INT#SHX=1:MOVE930,50:PRINT#SHX 2350P=2*(E1)=1 2360ENDPROC 2370DEFPROCend(2#) 2380V=4:V=V+2:12,17,27,12:CLS 2390P=21,3 2400PRINTTAB(3,2) "You "a2\$:DPUTTAB(0, 4) "Another go (Y/N) ",I\$ 2410IF I\$="Y":RUN ELSEEND 2420ENDPROC 2440DEFPROCint 2450L\$="":SHX=30E:SHX=30E:W=4 2460FORN=1TO7:READY:INX=1:NEXT 2470FORN=1TO6:READY:INX=1:NEXT 2480FORN=1TO4:READY:INX=1:NEXT | 2490FORN=1TO7:READY:INX=1:SHX=1:NEXT 2500FORN=1TO4:READY:INX=1:SHX=1:NEXT 2510FORN=1TO3:READY:INX=1:SHX=1:NEXT 2520FORN=1TO3:READY:INX=1:SHX=1:NEXT 2530FORN=1TO4:READY:INX=1:SHX=1:NEXT 2540IF P=31E=1:SHX=1:MOVE930,90:PRINT# HX:1:MOVE930,90:PRINT#HX 2550ENDPROC 2560DEFPROCend 2570FORN=1TO7:READY:INX=1:SHX=1:NEXT 2580FORN=1TO4:READY:INX=1:SHX=1:NEXT 2590FORN=1TO3:READY:INX=1:SHX=1:NEXT 2600FORN=1TO3:READY:INX=1:SHX=1:NEXT 2610FORN=1TO3:READY:INX=1:SHX=1:NEXT 2620FORN=1TO3:READY:INX=1:SHX=1:NEXT 2630FORN=1TO3:READY:INX=1:SHX=1:NEXT 2640FORN=1TO3:READY:INX=1:SHX=1:NEXT 2650FORN=1TO3:READY:INX=1:SHX=1:NEXT 2660DEFPROCscr 2670FORN=1TO4:READY:INX=1:SHX=1:NEXT 2680FORN=1TO4:READY:INX=1:SHX=1:NEXT 2690FORN=1TO4:READY:INX=1:SHX=1:NEXT 2700FORN=1TO4:READY:INX=1:SHX=1:NEXT 2710FORN=1TO4:READY:INX=1:SHX=1:NEXT 2720FORN=1TO4:READY:INX=1:SHX=1:NEXT 2730FORN=1TO4:READY:INX=1:SHX=1:NEXT 2740FORN=1TO4:READY:INX=1:SHX=1:NEXT 2750FORN=1TO4:READY:INX=1:SHX=1:NEXT 2760FORN=1TO4:READY:INX=1:SHX=1:NEXT 2770FORN=1TO4:READY:INX=1:SHX=1:NEXT 2780FORN=1TO4:READY:INX=1:SHX=1:NEXT 2790FORN=1TO4:READY:INX=1:SHX=1:NEXT 2800FORN=1TO4:READY:INX=1:SHX=1:NEXT 2810FORN=1TO4:READY:INX=1:SHX=1:NEXT 2820FORN=1TO4:READY:INX=1:SHX=1:NEXT 2830FORN=1TO4:READY:INX=1:SHX=1:NEXT | 2690FORN=1TO4:READY:INX=1:SHX=1:NEXT 2700FORN=1TO4:READY:INX=1:SHX=1:NEXT 2710FORN=1TO4:READY:INX=1:SHX=1:NEXT 2720FORN=1TO4:READY:INX=1:SHX=1:NEXT 2730FORN=1TO4:READY:INX=1:SHX=1:NEXT 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4630FORN=1TO4:READY:INX=1:SHX=1:NEXT 4640FORN=1TO4:READY:INX=1:SHX=1:NEXT 4650FORN=1TO4:READY:INX=1:SHX=1:NEXT 4660FORN=1TO4:READY:INX=1:SHX=1:NEXT 4670FORN=1TO4:READY:INX=1:SHX=1:NEXT 4680FORN=1TO4:READY:INX=1:SHX=1:NEXT 4690FORN=1TO4:READY:INX=1:SHX=1:NEXT 4700FORN=1TO4:READY:INX=1:SHX=1:NEXT 4710FORN=1TO4:READY:INX=1:SHX=1:NEXT 4720FORN=1TO4:READY:INX=1:SHX=1:NEXT 4730FORN=1TO4:READY:INX=1:SHX=1:NEXT 4740FORN=1TO4:READY:INX=1:SHX=1:NEXT 4750FORN=1TO4:READY:INX=1:SHX=1:NEXT 4760FORN=1TO4:READY:INX=1:SHX=1:NEXT 4770FORN=1TO4:READY:INX=1:SHX=1:NEXT 4780FORN=1TO4:READY:INX=1:SHX=1:NEXT 4790FORN=1TO4:READY:INX=1:SHX=1:NEXT 4800FORN=1TO4:READY:INX=1:SHX=1:NEXT 4810FORN=1TO4:READY:INX=1:SHX=1:NEXT 4820FORN=1TO4:READY:INX=1:SHX=1:NEXT 4830FORN=1TO4:READY:INX=1:SHX=1:NEXT 4840FORN=1TO4:READY:INX=1:SHX=1:NEXT 4850FORN=1TO4:READY:INX=1:SHX=1:NEXT 4860FORN=1TO4:READY:INX=1:SHX=1:NEXT 4870FORN=1TO4:READY:INX=1:SHX=1:NEXT 4880FORN=1TO4:READY:INX=1:SHX=1:NEXT 4890FORN=1TO4:READY:INX=1:SHX=1:NEXT 4900FORN=1TO4:READY:INX=1:SHX=1:NEXT 4910FORN=1TO4:READY:INX=1:SHX=1:NEXT 4920FORN=1TO4:READY:INX=1:SHX=1:NEXT 4930FORN=1TO4:READY:INX=1:SHX=1:NEXT 4940FORN=1TO4:READY:INX=1:SHX=1:NEXT 4950FORN=1TO4:READY:INX=1:SHX=1:NEXT 4960FORN=1TO4:READY:INX=1:SHX=1:NEXT 4970FORN=1TO4:READY:INX=1:SHX=1:NEXT 4980FORN=1TO4:READY:INX=1:SHX=1:NEXT 4990FORN=1TO4:READY:INX=1:SHX=1:NEXT 5000FORN=1TO4:READY:INX=1:SHX=1:NEXT 5010FORN=1TO4:READY:INX=1:SHX=1:NEXT 5020FORN=1TO4:READY:INX=1:SHX=1:NEXT 5030FORN=1TO4:READY:INX=1:SHX=1:NEXT 5040FORN=1TO4:READY:INX=1:SHX=1:NEXT 5050FORN=1TO4:READY:INX=1:SHX=1:NEXT 5060FORN=1TO4:READY:INX=1:SHX=1:NEXT 5070FORN=1TO4:READY:INX=1:SHX=1:NEXT 5080FORN=1TO4:READY:INX=1:SHX=1:NEXT 5090FORN=1TO4:READY:INX=1:SHX=1:NEXT 5100FORN=1TO4:READY:INX=1:SHX=1:NEXT 5110FORN=1TO4:READY:INX=1:SHX=1:NEXT 5120FORN=1TO4:READY:INX=1:SHX=1:NEXT 5130FORN=1TO4:READY:INX=1:SHX=1:NEXT 5140FORN=1TO4:READY:INX=1:SHX=1:NEXT 5150FORN=1TO4:READY:INX=1:SHX=1:NEXT 5160FORN=1TO4:READY:INX=1:SHX=1:NEXT 5170FORN=1TO4:READY:INX=1:SHX=1:NEXT 5180FORN=1TO4:READY:INX=1:SHX=1:NEXT 5190FORN=1TO4:READY:INX=1:SHX=1:NEXT 5200FORN=1TO4:READY:INX=1:SHX=1:NEXT 5210FORN=1TO4:READY:INX=1:SHX=1:NEXT 5220FORN=1TO4:READY:INX=1:SHX=1:NEXT 5230FORN=1TO4:READY:INX=1:SHX=1:NEXT 5240FORN=1TO4:READY:INX=1:SHX=1:NEXT 5250FORN=1TO4:READY:INX=1:SHX=1:NEXT 5260FORN=1TO4:READY:INX=1:SHX=1:NEXT 5270FORN=1TO4:READY:INX=1:SHX=1:NEXT 5280FORN=1TO4:READY:INX=1:SHX=1:NEXT 5290FORN=1TO4:READY:INX=1:SHX=1:NEXT 5300FORN=1TO4:READY:INX=1:SHX=1:NEXT 5310FORN=1TO4:READY:INX=1:SHX=1:NEXT 5320FORN=1TO4:READY:INX=1:SHX=1:NEXT 5330FORN=1TO4:READY:INX=1:SHX=1:NEXT 5340FORN=1TO4:READY:INX=1:SHX=1:NEXT 5350FORN=1TO4:READY:INX=1:SHX=1:NEXT 5360FORN=1TO4:READY:INX=1:SHX=1:NEXT 5370FORN=1TO4:READY:INX=1:SHX=1:NEXT 5380FORN=1TO4:READY:INX=1:SHX=1:NEXT 5390FORN=1TO4:READY:INX=1:SHX=1:NEXT 5400FORN=1TO4:READY:INX=1:SHX=1:NEXT 5410FORN=1TO4:READY:INX=1:SHX=1:NEXT 5420FORN=1TO4:READY:INX=1:SHX=1:NEXT 5430FORN=1TO4:READY:INX=1:SHX=1:NEXT 5440FORN=1TO4:READY:INX=1:SHX=1:NEXT 5450FORN=1TO4:READY:INX=1:SHX=1:NEXT 5460FORN=1TO4:READY:INX=1:SHX=1:NEXT 5470FORN=1TO4:READY:INX=1:SHX=1:NEXT 5480FORN=1TO4:READY:INX=1:SHX=1:NEXT 5490FORN=1TO4:READY:INX=1:SHX=1:NEXT 5500FORN=1TO4:READY:INX=1:SHX=1:NEXT 5510FORN=1TO4:READY:INX=1:SHX=1:NEXT 5520FORN=1TO4:READY:INX=1:SHX=1:NEXT 5530FORN=1TO4:READY:INX=1:SHX=1:NEXT 5540FORN=1TO4:READY:INX=1:SHX=1:NEXT 5550FORN=1TO4:READY:INX=1:SHX=1:NEXT 5560FORN=1TO4:READY:INX=1:SHX=1:NEXT 5570FORN=1TO4:READY:INX=1:SHX=1:NEXT 5580FORN=1TO4:READY:INX=1:SHX=1:NEXT 5590FORN=1TO4:READY:INX=1:SHX=1:NEXT 5600FORN=1TO4:READY:INX=1:SHX=1:NEXT 5610FORN=1TO4:READY:INX=1:SHX=1:NEXT 5620FORN=1TO4:READY:INX=1:SHX=1:NEXT 5630FORN=1TO4:READY:INX=1:SHX=1:NEXT 5640FORN=1TO4:READY:INX=1:SHX=1:NEXT 5650FORN=1TO4:READY:INX=1:SHX=1:NEXT 5660FORN=1TO4:READY:INX=1:SHX=1:NEXT 5670FORN=1TO4:READY:INX=1:SHX=1:NEXT 5680FORN=1TO4:READY:INX=1:SHX=1:NEXT 5690FORN=1TO4:READY:INX=1:SHX=1:NEXT 5700FORN=1TO4:READY:INX=1:SHX=1:NEXT 5710FORN=1TO4:READY:INX=1:SHX=1:NEXT 5720FORN=1TO4:READY:INX=1:SHX=1:NEXT 5730FORN=1TO4:READY:INX=1:SHX=1:NEXT 5740FORN=1TO4:READY:INX=1:SHX=1:NEXT 5750FORN=1TO4:READY:INX=1:SHX=1:NEXT 5760FORN=1TO4:READY:INX=1:SHX=1:NEXT 5770FORN=1TO4:READY:INX=1:SHX=1:NEXT 5780FORN=1TO4:READY:INX=1:SHX=1:NEXT 5790FORN=1TO4:READY:INX=1:SHX=1:NEXT 5800FORN=1TO4:READY:INX=1:SHX=1:NEXT 5810FORN=1TO4:READY:INX=1:SHX=1:NEXT 5820FORN=1TO4:READY:INX=1:SHX=1:NEXT 5830FORN=1TO4:READY:INX=1:SHX=1:NEXT 5840FORN=1TO4:READY:INX=1:SHX=1:NEXT 5850FORN=1TO4:READY:INX=1:SHX=1:NEXT 5860FORN=1TO4:READY:INX=1:SHX=1:NEXT 5870FORN=1TO4:READY:INX=1:SHX=1:NEXT 5880FORN=1TO4:READY:INX=1:SHX=1:NEXT 5890FORN=1TO4:READY:INX=1:SHX=1:NEXT 5900FORN=1TO4:READY:INX=1:SHX=1:NEXT 5910FORN=1TO4:READY:INX=1:SHX=1:NEXT 5920FORN=1TO4:READY:INX=1:SHX=1:NEXT 5930FORN=1TO4:READY:INX=1:SHX=1:NEXT 5940FORN=1TO4:READY:INX=1:SHX=1:NEXT 5950FORN=1TO4:READY:INX=1:SHX=1:NEXT 5960FORN=1TO4:READY:INX=1:SHX=1:NEXT 5970FORN=1TO4:READY:INX=1:SHX=1:NEXT 5980FORN=1TO4:READY:INX=1:SHX=1:NEXT 5990FORN=1TO4:READY:INX=1:SHX=1:NEXT 6000FORN=1TO4:READY:INX=1:SHX=1:NEXT 6010FORN=1TO4:READY:INX=1:SHX=1:NEXT 6020FORN=1TO4:READY:INX=1:SHX=1:NEXT 6030FORN=1TO4:READY:INX=1:SHX=1:NEXT 6040FORN=1TO4:READY:INX=1:SHX=1:NEXT 6050FORN=1TO4:READY:INX=1:SHX=1:NEXT 6060FORN=1TO4:READY:INX=1:SHX=1:NEXT 6070FORN=1TO4:READY:INX=1:SHX=1:NEXT 6080FORN=1TO4:READY:INX=1:SHX=1:NEXT 6090FORN=1TO4:READY:INX=1:SHX=1:NEXT 6100FORN=1TO4:READY:INX=1:SHX=1:NEXT 6110FORN=1TO4:READY:INX=1:SHX=1:NEXT 6120FORN=1TO4:READY:INX=1:SHX=1:NEXT 6130FORN=1TO4:READY:INX=1:SHX=1:NEXT 6140FORN=1TO4:READY:INX=1:SHX=1:NEXT 6150FORN=1TO4:READY:INX=1:SHX=1:NEXT 6160FORN=1TO4:READY:INX=1:SHX=1:NEXT 6170FORN=1TO4:READY:INX=1:SHX=1:NEXT 6180FORN=1TO4:READY:INX=1:SHX=1:NEXT 6190FORN=1TO4:READY:INX=1:SHX=1:NEXT 6200FORN=1TO4:READY:INX=1:SHX=1:NEXT 6210FORN=1TO4:READY:INX=1:SHX=1:NEXT 6220FORN=1TO4:READY:INX=1:SHX=1:NEXT 6230FORN=1TO4:READY:INX=1:SHX=1:NEXT 6240FORN=1TO4:READY:INX=1:SH |
|---|---|--|

3550770, 31, 62, 93, 153, 186, 217, 348, 493,
454, 465, 496, 588, 589, 620, 651, 72, 63, 94, 156,
127, 178, 244, 404, 435, 466, 497, 559, 590, 621,
127, 178, 454, 1, 2, 3, 4, 31, 32, 33, 34, 62, 63, 64,
95, 94, 126, 487, 552, 553, 554, 555, 620, 621, 62,
1, 621, 553, 554, 554, 555, 559, 527
3550771, 31, 44, 94, 129, 158, 198, 218, 248,
489, 493, 494, 495, 551, 581, 621, 651, 279,
280, 291, 301, 311, 311, 341, 342, 343, 372, 373,
274

Screen Scroller

Sys 49363 to scroll rightwards.



| | | |
|----|------|---|
| 24 | DATA | 169, 32, 162, 48, 157, 255, 3, 282, 208 |
| 25 | DATA | 250, 95, 173, 85, 192, 56, 233, 48, 141 |
| 26 | DATA | 85, 192, 176, 3, 286, 85, 192, 173, 88, 192 |
| 27 | DATA | 56, 233, 48, 141, 88, 192, 176, 3, 286, 85 |
| 28 | DATA | 192, 76, 82, 192, 162, 0, 169, 4, 133, 252 |
| 29 | DATA | 138, 133, 251, 160, 1, 177, 251, 136, 145 |
| 30 | DATA | 251, 208, 200, 192, 48, 208, 245, 165, 251 |
| 31 | DATA | 24, 185, 48, 133, 251, 144, 2, 236, 252 |
| 32 | DATA | 232, 224, 25, 208, 227, 169, 39, 141, 4 |
| 33 | DATA | 193, 169, 4, 141, 8, 193, 76, 3, 193, 162 |
| 34 | DATA | 0, 169, 4, 133, 252, 138, 133, 251, 160 |
| 35 | DATA | 38, 177, 251, 200, 145, 251, 136, 136, 192 |
| 36 | DATA | 255, 208, 245, 165, 251, 24, 185, 48, 133 |
| 37 | DATA | 251, 144, 2, 236, 252, 232, 224, 25, 208 |
| 38 | DATA | 227, 169, 0, 141, 4, 193, 169, 4, 141, 8 |
| 39 | DATA | 193, 169, 0, 133, 251, 169, 4, 133, 252 |
| 40 | DATA | 160, 0, 162, 0, 169, 32, 145, 251, 232, 224 |
| 41 | DATA | 25, 240, 14, 165, 251, 24, 185, 48, 133 |
| 42 | DATA | 251, 144, 238, 230, 252, 76, 15, 193, 96 |

UXB by Ian Grainger

This is the third and final part of UXB, the arcade style game. The game is available for £2 if

you haven't been typing the listing in. Send your money to Ian Grainger, 33 Wellfield Road, Co Durham TS28 5LA.

```
5899 REM Reduce time
5900 PRINT AT 17,tab; INK 2; PAPER 2; "
: LET time=time-1
5910 IF time=6 THEN LET lost=1: RETURN
5920 RETURN
5999 REM Set skulls, flags and bomb
6010 FOR f=1 TO 5
6015 LET x1=INT (RAND*16)+1: LET y1=INT
RAND*8)+1
6020 IF b(x1,y1)=1 THEN LET x1=x1+1:
PRINT AT (y1-1)*2, (x1-1)*2; INK 4;
: "AT (y1-1)*2+1, (x1-1)*2+1; INK 4;
: GO TO 6040
6030 GOTO 6055
6040 FOR f=1 TO 10: INK 4; "
6045 LET x1=INT (RAND*16)+1: LET y1=INT
RAND*8)+1
6050 IF b(x1,y1)=1 THEN LET b(x1,y1)+1:
PRINT AT (y1-1)*2, (x1-1)*2; INK 7;
: "AT (y1-1)*2+1, (x1-1)*2+1; INK 7;
: NEXT f:
GO TO 6070
6060 GO TO 6045
6070 LET x1=INT (RAND*16)+1: LET y1=INT
RAND*8)+1
6080 IF b(x1,y1)<1 THEN GOTO 6070
6090 LET b(x1,y1)+5: PRINT AT (y1-1)*2,
x1-1)*2; INK 6; "AT (y1-1)*2+1, (x1-1)*2+1;
INK 6;
6100 RETURN
6109 REM Congratulations- The End
6110 RANDOMIZE USR 4200
6120 LET a$="CONGRATULATIONS!"
6130 FOR f=1 TO LEN a$: FOR i=1 TO 7: PR
INT AT (i*30+1), i; INK 10; (f): BEEP .001
4; NEXT i: BEEP .1; NEXT f
6140 PRINT AT 1,1; INK 5; "That was abso
lutely magnificent!"; BEEP .1; 10
6150 PRINT AT 5,5; INK 6; "Be: you never
thought you would!"; BEEP .1; 10
6160 PRINT AT 7,12; INK 7; "GO IT!"; BEEP
.1; 10
6169 REM Little Ditts
6170 DATA .4,0,.4,2,.4,4,.8,5,.8,4,.8,3,
.8,2,.8,1,.2,9,.5,7,.3,5
6180 RESTORE 6170; FOR n=1 TO 11: READ a
,: FOR f=1 TO (a*30)/2: BEEP .9; b: SEE
P .01,b;12; NEXT f: NEXT n
6190 FLASH 1: LET p=6: LET p1=0: LET n=1
: LET i=7: LET x=0: LET y=2: LET a$="0
ant wait? Press a key to go on!"; GO SUB
9000: FLASH 8
6200 IF INKEY$="" THEN GO TO 6200
6210 GO TO 590
6998 STOP
6999 REM work out where you are
7000 IF x=16 THEN LET x=1
7010 IF x<1 THEN LET x=16
7020 IF y=8 THEN LET y=1
```

```
7030 IF y=1 THEN LET y=8
7040 IF x=1,y=8 THEN GO TO 7090
7050 PRINT AT (y-1)*2, (x-1)*2; INK 5;
: "AT (y-1)*2+1, (x-1)*2+1; INK 5;
: LET x=x+1:
IF x=16 THEN LET x=1
7060 IF b(x,y)=3 OR b(x,y)=4 THEN LET 1
:=1: GO TO 7090
7070 IF x=y=2 THEN FOR f=1 TO 3: BEE
P .1; b: BEEP .1; NEXT f: LET a$="
7080 GO SUB 7040
7090 IF x=y=8 THEN FOR f=1 TO 3: BEE
P .1; b: BEEP .1; NEXT f: LET a$="
7100 GO SUB 7040
7110 RETURN
7499 REM score movement
7500 IF w=16 THEN GO SUB 7590: LET w=
15: GO TO 7580
7501 IF w<0 AND b(w+1,y)/2 THEN GO 5
UB 7590: LET w=w+1: GO TO 7580
7509 IF w<1 THEN GO SUB 7590: LET w=2
: GO TO 7580
7510 IF w<0 AND b(w-1,y)/2 THEN GO 5
UB 7590: LET w=w-1: GO TO 7580
7519 IF w=9 THEN GO SUB 7590: LET w=7
: GO TO 7580
7520 IF w/y=1 AND b(w,y+1)/2 THEN GO 5
UB 7590: LET w=w+1: GO TO 7580
7529 IF w=1 THEN GO SUB 7590: LET w=2
: GO TO 7580
7530 IF w/y=1 AND b(w,y-1)/2 THEN GO 5
UB 7590: LET w=w-1: GO TO 7580
7539 IF w=9 THEN GO SUB 7590: LET w=7
: GO TO 7580
7540 IF b(w,y)/2 THEN GO SUB 7590:
LET w=w+1: GO TO 7580
7549 IF w=1 THEN GO SUB 7590: LET w=2
: GO TO 7580
7550 IF b(w,y-1)/2 THEN GO SUB 7590:
LET w=w-1: GO TO 7580
7559 IF w=16 THEN GO SUB 7590: LET w=
15: GO TO 7580
7560 IF b(w+1,y)/2 THEN GO SUB 7590:
LET w=w+1: GO TO 7580
7569 IF w=1 THEN GO SUB 7590: LET w=2
: GO TO 7580
7570 IF b(w-1,y)/2 THEN GO SUB 7590:
LET w=w-1: GO TO 7580
7580 BEEP .91; b: RETURN
7590 LET b(w,y)+1
7600 PRINT AT (w-1)*2, (w-1)*2; PAPER 1
: INK 6; "AT (w-1)*2+1, (w-1)*2+1;
: RETURN
7999 REM Life lost
8000 LET 1=1-1
8010 PRINT AT (y-1)*2, (x-1)*2; INK 6; "
: "AT (y-1)*2+1, (x-1)*2+1; INK 6;
8020 GO SUB 4030
```

```
8030 GO SUB 5020
8040 RETURN
8799 REM position worm
8800 LET w=INT (RAND*16)+2: LET wy=INT
RAND*6)+2: IF b(w,wy)<1 THEN GOTO 890
0
8810 PRINT AT (w-1)*2, (w-1)*2; INK 3;
: "AT (w-1)*2+1, (w-1)*2+1; INK 3;
8815 LET b(w,wy)=4
8816 IF w=x AND w=y THEN LET lost=2
8920 RETURN
8999 STOP
9000 REM Print routine
9010 PAPER 1: INK 1: PRINT AT y,x: FOR f
=1 TO LEN a$: PRINT a$(f); BEEP .01; b:
NEXT f: PAPER 1: INK 1: RETURN
9019 REM Flag up
9020 FOR f=16 TO 8 STEP -1
9030 PRINT AT f,10; INK 1; "A
T f,10; PAPER 1: INK 7; "end of" "A
T f+3,10; INK 1; "AT f+3,10;
PAPER 6; "
9040 NEXT f: PRINT AT m-2, mch(1); RETU
RN
9499 REM Flag tune
9500 DATA .5,5,1,-999,.5,5,1,-999,.25,
5,1,-999,.5,7,5,5,5,3,5,2,75,3,25,
8,5,-2,4,-999,75,-3,75,-2,75,8
9510 DATA .5,5,1,-999,.5,5,1,-999,.25,
5,1,-999,.5,7,5,5,5,3,5,2,75,3,25,
0,5,-2,4,-999,75,-3,75,-2,75,0
9520 DATA .25,5,1,-999,.5,5,1,-999,.5,
5,1,-999,.5,2,25,0,5,-2,5,0
9530 DATA .25,5,1,-999,.5,5,1,-999,.5,
5,1,-999,.5,2,25,0,5,-2
9540 DATA .4,-999,.25,5,1,-999,.5,5,1,
-999,.5,5,1,-999,.25,2,25,0,25,-2
9550 DATA .1,-999,.25,-2,1,-999,.25,-2,
5,0,5,-2,1,-999,75,-2,4,-999,.25,5,
.25,-2,25,2,25,7,25,5,3,-999,75,5,
4,-999,.25,5,1,-999
9560 DATA .5,5,1,-999,.5,5,1,-999,.5,2
,25,0,5,-2,5,0,2,-999,.25,5,1,-999,
.5,5,1,-999,.5,5,1,-999
9570 DATA .5,2,25,0,5,-2,4,-999,.25,5,
1,-999,.5,5,1,-999,.5,5,1,-999,5,2,
.25,0,25,-2
9580 DATA .1,-999,.25,-2,1,-999,.25,-2,
5,0,5,-2,1,-999,1,-2,10,-999,-1,1
9590 RESTORE 9500: FOR n=1 TO 120: READ
a,b
9595 IF a=-1 THEN GO TO 9600
9610 IF b=-999 THEN PAUSE (a*30)/2: GO
TO 9630
9620 FOR f=1 TO (a*30)/2: BEEP .61; b: BE
EP .01,b;12; NEXT f
9625 IF INKEY$="" THEN RANDOMIZE USR 6
4200: RETURN
9630 NEXT n
```

Memory Check

by Robert Davis

The following routine on the QL will, when called by typing *mem check*, print on screen the number of bytes used by your program and the number of free bytes left.

The routine itself can be added on to the end of a program under development and called periodically to check on the available free memory.

```

9000 DEFine PROCEDURE mem_check
9010 CLS
9020 LET bytes_used=PEEK_L(163860)-PEEK_L(163856)-4096
9030 REMARK IF QL with core the 128k
9040 REMARK then change the 128.
9050 LET bytes_left=(128*1024)-bytes_used
9060 CSIZE 3,0:INX 4:CLS40
9070 PRINT"Bytes used : ";bytes_used
9080 PRINT"Bytes left : ";bytes_left
9090 END DEFine mem_check
    
```

Filler

by M Ulyatt

This procedure for the BBC caused by *Proc fill (xp%,yp%,c%)*, performs a basic filling function. The co-ordinates of the starting point for the fill are xp% (horizontal) and yp% (vertical) with the colour used being c%.

It should be noted that only black backgrounds will be filled in and that the routine will stop filling in whichever direction it was progressing at the time, on encountering a non-black pixel.

```

9000 DEFPROC fill11 (xp%,yp%,c%)
9010 AX=yp%:GCOLOR,c%
9020 IFPOINT (xp%,AX) <> 0 GOTO 9050
9030 PLOT 77,xp%,AX
9040 AX=AX-4:GOTO 9020
9050 AX=yp%+4
9060 IFPOINT (xp%,AX) <> 0 ENDPROC
9070 PLOT 77,xp%,AX
9080 AX=AX+4:GOTO 9060
    
```

Tape Directory

by S Mitchell

The purpose of this program for the Vic 20 is to print a directory of programs stored on a particular cassette using an MPS 801 dot matrix printer.

To print the directory, ensure that the printer is switched on first, then insert your tape and start the tape recorder. Program titles will then be displayed on the screen and printed, although titles containing Vic graphics symbols are not guaranteed to be displayed correctly.

The program has no method of detecting the end of the tape so the user must press the Stop/Restore button.

```

2 POKE36879,110:PRINT"***":
  FORT=71680:7168+13:READ:POKET,R:NEXT
3 DATA162,0,189,65,3,157,0,30,232,224,16,
  208,245,96
4 OPEN1,1:CLOSE1:SY67168
5 FORT=76800:7695:POKET,PEEK(T)+64#
  (PEEK(T)>64):NEXT
6 AS="" : FORT=76800:7695:Z=PEEK(T)
7 IFZ>31 THEN AS=AS+CHR$(Z):GOTO9
8 AS=AS+CHR$(Z+64)
9 NEXT:OPEN4,4:PRINT#4,AS:CLOSE4:RUN
    
```

We want your programs!!

Yes, this is your chance to get rich and famous. Well, famous anyway, as *Popular Computing Weekly* is looking for contributions to the Programming pages.

What sort of thing are we looking for? You name it - anything original from games to utilities, applications and the like, written in Basic, machine code or anything else you can think of.

Programs for any computer will be considered, not just the old faithfuls

(Spectrum, Amstrad, QL, Commodore, etc), so send those listings in. What we need is a working copy of the program on tape or disc, plus an accompanying article or documentation that you would anticipate going with the piece, normally not over 2000 words.

Alternatively, send in your short programs in to the Bytes and Pieces page - what could be easier?

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pages and £5 for each Bytes & Pieces contribution we publish. Plus the fact that your name will be indelibly carved in the *Popular Computing Weekly*, 12-13 Little Newport St. London WC2 7PP and he'll assess them post haste.

Just send your masterpieces in to Duncan Evans, Technical Editor, *Popular Computing Weekly*, 12-13 Little Newport St. London WC2 7PP and he'll assess them post haste.



With Kenn Garroch

Non-Plussed 1

Edward Barnett of Leavesdon, near Watford writes:

Q Is there such a thing as a Plus 1 interface built into the Acorn Electron, or is it an add-on extra? I bought a game the other week and it says, "Some of these games will not load because of the Plus 1 interface, if you have difficulties, disconnect the Plus 1". I have not had any difficulties and all of the games load so, could you describe where and what the Plus 1 is?

A When the Electron was brought out, it was part of the BBC micro family, but did not have the many interfaces of the older machine. The Plus 1 was an add-on brought out by Acorn to try to correct this. It consisted of a box that clipped on to the back of the Electron and provided the machine with an analogue joystick interface, a cartridge socket and a centronics printer port.

Later on, Acorn brought out the Plus 3, a 3.5 inch disc interface and drive.

Sys significance

S Singh writes:

Q I own a CBM 64 and am writing a game. As you know, Basic is not very fast so, I would like to use the Sys command. I know that to use the Sys command you have to Poke numbers into the memory and call up these with a Sys.

I want to know what each number stands for and what they do.

A At the heart of the C64 is a microprocessor known as a 6502 which, by itself, cannot understand Basic commands. What it does understand are numeric codes (op codes) that tell it to do very simple things such as moving a value from one place to another, adding, subtracting etc. This is machine code (the numbers you poke into memory and call with Sys are the same). By grouping these codes into sections, the machine can be made to perform more complex operations such as reading the keyboard, printing to the screen and understanding and performing Basic commands.

Using a manual for the 6502 it is possible to create machine code programs by looking up the various commands finding their numbers and poking them into memory. This, however, is a very tedious process and is a job usually handled by a program called an assembler.

Here, each code is given a mnemonic name, eg LDA loads something into the accumulator (a place inside the microprocessor where numbers can be operated on). STA stores the contents of the accumulator in memory. Using mnemonics, it is much easier to write programs since they are more easily read, and all the work of turning them into numbers is left to the assembler.

Once a section of code has been assembled, it can be loaded into the memory and, from Basic, a Sys call can be made to its start address to execute it. So, to write your game, in machine code, you will need a book on the 6502, preferably when used in conjunction with the C64, and an assembler.

The best books to go for are Rodney Zaks' *Programming the 6502*, and First Publishing's *Anatomy of the 64*.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2R 3LD

The Hex hex

A Heiman of St Leonards on Sea writes:

Q I have a Spectrum 128K, and my problem is that any article about computers and the 128K begins "ABCF" hex or "FFFF" hex. I can figure FF=255 but any further seems beyond me. Is there a table anywhere? If not, is there a program which converts from hex to normal figuring? Is there an arithmetic solution?

A Hex is not the curse that some people seem to think it is, it's simply a way of representing numbers that is more convenient for use with computers. Normal figuring, is done to base ten which means that when you reach nine, the next number is two digits, the one representing 1*10 and the zero representing 0*1. This becomes a little clearer if you take a number like 123 (decimal). The value is one times one hundred, plus two times ten plus three times one.

Taking the columns from right to left, the first is the ones, the second the tens, the third, hundreds. More arithmetically, these are (right to left) 10⁰, 10¹, 10², 10³, etc (10 to the power of 0 is 1 and ten to the power of 1 is ten and ten to the power of 2 is one hundred and so forth). So 324 is (4*10⁰) + (2*10¹) + (3*10²).

Extending this to hexadecimal where the base is 16, the columns from right to left will be 16⁰, 16¹, 16², 16³. Also, since the second column starts at 16 (16 to the power of 1 is sixteen), it is necessary to count 16 ones to reach it. In base ten, the figures 0-9 are used before reaching 10. In base 16, we add A,B,C,D,E,F after nine to give 16 digits. This may sound awfully complex but converting between hex and decimal is quite easy.

Take the first column and change it to a decimal number, so 0-9 stay as they are, A-F become 10-15. Do the same with the second, third, and succeeding columns, then multiply these values by 16 to the power of the column number (the rightmost column is numbered zero) and add them together, eg:

ABCF becomes 10,11, 12,15, then:
(10*16³) + (11*16²) + (12*16¹) + 15*16⁰, which is:
(10*4096) + (11*256) + (12*16) + (15*1), which comes to 43983 in decimal.

To go the other way (from decimal to hex) is a little more difficult; the simplest method is the double dabble method which can be used for any base (for binary just divide by two instead of 16).

Take the number to be converted to hex (43983 seems like a good choice) and divide by 16. The result can be taken as two parts, the remainder, and the whole number of times 16 went into 43983 (the quotient). Write down the remainder (found by removing the decimal part of the result and multiplying the resulting integer by 16, then subtract from the original, if you are using a calculator).

With our example, this is: 43983/16=2748.9375
(16*2748=43968 and 43983-43968=15) or 2748 remainder 15.

Take the quotient (2748) and perform the same operation:

2748/16=171 remainder 12
Take the quotient (171) and do it again:

171/16=10 remainder 11
The quotient is now less than 16 so this is taken as the last remainder (10) and the conversion is almost complete. Take all the remainders in the order they were found: 15, 12, 11, 10 and reverse the order: 10, 11, 12, 15. Then, if any are greater than 9, substitute the appropriate hex letters (10=A 11=B 12=C 13=D 14=E 15=F) and there is the result: ABCF.

The reason for using hexadecimal is that each digit of a hex number can be represented by four binary digits (0000-1111 is 0-F) so converting from hex to binary and vice versa is simplicity itself. 0100101100011000=4B18.



Adventuring via the modem – it's a Mug's game

David Wallin boldly goes into the world of the Gods and Shades, and wallows in MUD

I'm sure everyone has heard of *MUD* by now. *MUD* stands for Multi-User Dungeon and was the first MUG (Multi-User Game) written. At this point I should mention that 99 percent of MUGs are adventures of some sort or other, and I'll only be dealing with adventures this week.

The original version of *MUD* was written on, and still resides on, Essex University's Dec-10 mini-computer. It was written in 1979 by an undergraduate called Roy Trubshaw. In 1980 it was updated and improved by Richard Bartle. This version is the version that both BT and Compunet now use.

Richard Bartle, Simon Dally and Roy Trubshaw decided to set up a company to market *MUD* and other MUGs, MUSE (Multi User Entertainment Ltd.), now have expanded versions of *MUD* planned as well as other MUGs on the way. The cost of BT *MUD* has recently been cut to a special offer, the starter pack costing only £4.95 now. Access charges have also been cut by 50 percent.

As with BBs you get company-run MUGs like BT *MUD*, and enthusiasts run MUGs, like *Gods* and *Shades*. Both these will be reviewed in a few weeks in this column.

Most MUGs are very similar to normal adventure games; you get a description of the room you're in and you type a command. There are the usual *North*, *South*, *East*, *West*, *Get*, *Drop*, etc. commands and also commands like *Say*, *Give* or *Follow*, which allow inter-action with the other players. In a MUG, don't forget most of the other characters are human and so are intelligent and should react sensibly (though often they don't) to your actions.

When you log on to a MUG, you will need to choose a persona for your character. A persona is like a CB handle — mine is Communicator. You can choose a persona that reflects who you are or what you are like, or often, personae come from literature; Gandalf is a very common persona. There are no rules about choosing a persona, but they generally have the first word as short as possible (I'll explain why in a minute), and often funny, like Angelina the Dangerously Sane. You also have to choose the sex of the persona (on some MUGs, the spell 'change', will change the sex of a

character) and a password.

On *Gods*, you start as scum and must become a God. On *MUD*, to improve your level, you must collect treasure and take it to the swamp, and on *Gods* you must offer it to one of the Gods in his temple. On *MUD* when you become a wizard it is the end of that part of the game.

You can then start again, as with a normal adventure, but you'll now find you are very powerful and able to do many things, like killing people, giving them more points, spying on them, moving treasure, etc. On *Gods*, a God only stays a God while people provide him or her with treasure and so they can become mere mortals again.

In all MUGs you can talk to the other players. On *MUD* you can talk by typing: *Tell [name]* Tell the person [name] the message [message]

Shout [message] Shout [message] to all players.

"[message]" Tell everyone at your location the message [message].

The reason for keeping the start of a persona short is because this is the name used in conversations and *Tell Dan Hello* is a lot quicker to type than *Tell wonderful Hello* (a persona might be wonderful Dan the insane).

Talking to other players can be useful. You can plot to kill another player who you all dislike, but beware, most MUGs let you have more than one persona, so persona abc and xyz could both belong to the same person. That means that if you talk to abc about killing xyz, abc is likely to kill you!

I have often found that when I log on to *Gods*, I stay in my Hotel Room (where you start) or one of the rooms just outside it for an hour or two just talking to people. I have listened to many conversations on pop music, hacking and communications, since conversations are often on subjects that Bulletin Boards would dedicate a Sig to.

MUGs are great fun to play. I often use *Gods* and I am usually on-line for at least an hour or two at a time. This does unfortunately incur a high phone bill. Different MUGs have different charging methods. BT *MUD* costs £4.95 (at the

moment) to register to and a certain amount per hour on-line. On *Gods* there is a one off charge of £23 and access time is not charged. *Shades* is totally free, except, of course, for the phone bill. MUGs can seriously damage your financial status. Play with care.

Why not give *Shades* and *Gods* a ring? If you have PSS then give Essex University *MUD* a ring as well.

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01-994 9119, *Gods*
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(return)
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Sing a song with Amstrad

Mark Jenkins plays with some new packages

THE AMSTRAD CPC series is reasonably well served as far as music packages go, although the major instrument companies haven't picked up on the machines yet since they haven't penetrated much into Japan or the US.

As with other machines, such as the Commodore 64, music packages are divided between those for the built-in three-voice sound chip, those using additional hardware, and those for Midi applications, so we'll look at these three fields in turn.

The Amstrad's sound chip isn't as powerful as the Commodore's SID chip, so software-only products have a hard time to improve. But *Minstrel* from Kuma Computers (£14.95 cassette, £19.95 disk) and *Music Box* from The Electric Studio (£9.95 cassette, £16.95 disk) are both good starting points for the inexperienced musician. *Rainbird: The Music System*, or *Advanced Music System* packages are superior although more expensive, and as on the BBC version seek to improve the Amstrad's sound by adding modulation generators and other effects in software.

TMS/AMS runs on the CPC 464/664/6128, and is available on disk only in the *AMS* version, which adds printer and linker options for longer composition. Basic operation is in the style of a tape machine with familiar fast forward/rewind and other controls, and there's a synthesiser page which allows you to create and save your own sounds as well as complete compositions. You can upgrade from *TMS* to the £29.95 *AMS* for £14 (from cassette) or £10 (from disk).

TMS/AMS is icon-based, which can be more of a hindrance than a help since some of the icons are a little obscure - I'd have preferred more labelling in English. There's no Midi on the Amstrad version either, but *TMS* certainly makes the best of what's available on-board.

Music Master from Vanguard Leisure is more approachable, and is an entry level music package which offers six instrumental sounds for any one of the three voices. The cursor keys are used to select which voice is recorded and left to play in the background and you can play

'live' from the computer keyboard over the top. The keyboard uses a window of three octaves at a time out of a total range of eight octaves, and you can add percussion effects by playing the keypad keys 4-9.

Compositions can be saved to tape or disc and the screen display of a piano keyboard shows which notes are being played at any time. There's no editing or synthesising facility but at £12.95 (cassette) or £15.95 (disc) the *Music Master* package is a good starter's guide to composition.

On the hardware front, Vanguard also markets *Maestro*, a package offering a small stereo amplifier, headphones, two 3-inch speakers and a music demo cassette which takes advantage of the Amstrad's stereo sound output. *Music Master* and all the other onboard sound packages mentioned would probably benefit greatly from the addition of *Maestro*.

We've mentioned *AmDrum* before on these pages - it's the Amstrad version of *SpecDrum*, a small cartridge which replays sampled drum sounds and allows you to compose long patterns using them. It's available through Boots and manufactured by Cheetham Marketing, and gives two loading options for different sets of drum sounds. Two alternative kits - *Latin Kit* and *Editor* and *Electro Kit* and *Editor* - are also now available at £3.99 and £4.99 respectively. The editor section of the software allows you to combine sounds from different kits to create your own distinctive combination of drums.

Beats can be entered in real or step time, two sounds can be played simultaneously, and a composer page allows you to chain patterns into very lengthy compositions. Sample quality is on a par with £300 drum machines, so the *AmDrum* comes highly recommended. Incidentally, Cheetham publish a sheet on how to synchronise *AmDrum* to other musical instruments.

The only Midi package available for the Amstrad micros at the moment is *EMR's* *MidiTrack Performer*, which costs £129.95 for a tape and disc, and a Midi interface which works with the

464/664/6128 micros. Performer handles eight tracks of polyphonic Midi information entered in real or step time from a synth keyboard (Casio 0210) prices are now down to £175 second-hand), and you can bounce down for a total of 29 tracks.

The single main display is operated using the cursor keys and space bar, although you can use a joystick to control tempo. Save, Load, Delete, File Name, Clear, Text, Arrange and Time Correct functions are all available on the right of the screen, the last of these referring to Performer's ability to tidy a sloppy keyboard performance to a variable degree.

Metronome, variable Count-In, variable Clock, Time Signature and Bar Length are available and you can "punch in" to start recording at any bar, then chain up to 64 sections for compositions up to 20 minutes long. Total capacity is around 8,000 notes. We hope to look at some other Amstrad Midi packages in the near future.

If you have any queries or tips for this column, please write to Mark Jenkins at *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.



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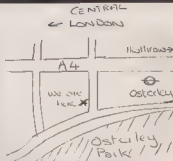
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John Cook looks through this week's new arrivals

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Program Music Box Type Whilby Micro Amstrad CPCs **Price** £12.95 **Supplier** Melbourne House, 60 High Street, Hampton Wick, Kingston-Upon-Thames, Surrey.

Program Magic Maths Type Educational Micro Amstrad CPCs **Price** £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

Program Big Top Barney Type Arcade Micro Amstrad CPCs **Price** £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

Program International Karate Type Arcade Micro Amstrad CPCs **Price** £7.95 tape, £12.95 disc **Supplier** Endurance Games, 23-25 Castle-reagh Street, London W1.

Program Speed King Type Arcade Micro Amstrad CPCs **Price** £1.99 **Supplier** 8-10 Paul Street, London EC2.

Program Space Shuttle Type Simulation Micro Amstrad CPCs **Price** £9.99 tape, £14.99 disc **Supplier** Activation, 23 Pond Street, London NW3.

Program Mission Omega Type Strategy Micro Amstrad CPC **Price** £9.95 (tape) £12.95 (disc) **Supplier** Mind Games, Argus Press Software, Victory Games, Leicester Place, London WC2.

Mind Games seems to be in the business of developing detailed, if somewhat graphically dull, strategy programs and the appearance of *Mission Omega* confirms this suspicion. The game has you con-

structing and controlling a team of robots with the aim of shutting down four reactors aboard a 'mysterious object' that is rapidly approaching the Earth. All this activity is fully icon controlled (via cursor or joystick) and is certain to appeal to Mind Games' fans in that the brain must be fully engaged before you start - but I can't help thinking that it's not going to win any new converts to the MG cause.

Amstrad PCWs

Program First Base Type Utility Micro Amstrad PCWs **Price** £29.95 **Supplier** Minerva Systems, 69 Sidwell Street, Exeter EX4 6PH.

Program Learn Loco Type Educational Micro Amstrad PCWs **Price** £16.95 **Supplier** Minerva Systems, 69 Sidwell Street, Exeter EX4 6PH.

Atari ST

Program Pro Fortran 77 Type Utility Micro Atari ST **Price** £129 + VAT **Supplier** Prospero Software, 190 Castelnau, London SW13 9DH.

Program Pro Pascal Type Utility Micro Atari ST **Price** £129 + VAT **Supplier** Prospero Software, 190 Castelnau, London SW13 9DH.

Program K-Speed Type Utility Micro Atari ST **Price** £49.95 **Supplier** Kuma Computers, 12 Horseshoe Park, Pangbourne, Berks RG8 7JW.

Program K-Graph Type Utility Micro Atari ST **Price** £39.95 **Supplier** Kuma Computers, 12 Horseshoe Park, Pangbourne, Berks RG8 7JW.

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Program Sunstar Type Arcade Micro Atari XL/XE **Price** £9.95 tape, £14.95 disc **Supplier** CRL, 9 Kings Yard, Carpenter's Road, London E15 2HD.

Pick of the week

Mad about Marbles

Program Marble Madness Type Arcade Micro Commodore Amiga **Price** £29.95 **Supplier** Aniolsoft, 68 Long Acro, Covent Garden, London WC2.

About 9 months ago, a new sub-class of arcade game came on to the home computer market, starting with Melbourne House's *Gyroscope*. You remember - the "move the rolling object over the undulating, scrolling landscape avoiding the obstacles to the final goal within a time limit my goodness this reminds me of *Marble Madness*" type of game.

To be fair, titles such as *Spindizzy*, have taken the original *Marble Madness* concept and extended it considerably - but now (if you are rich enough to have an Amiga) you can cast aside imitations and derivations alike and experience the real thing that had all headbangers running for the arcades in their thousands.

Marble Madness on the

Amiga is great. Electronic Arts has made an exact copy of the coin-op original, complete with outstanding graphics, super smooth scrolling and fabby sound. It lovingly recreates all six levels (practice, beginner, intermediate, ariel, silly and ultimate), which - when you finish - (I'm working on it) you do backwards, then upside down... then the landscape starts going invisible... eek!

Suffice to say, with seven difficulty levels, choice of controls (mouse, trackball, joystick) and one or two player options, this is a game that you will keep coming back to time and time again. On very rare occasions, the marble does flicker just ever so slightly and you do have to wait for each level to be loaded as you complete it, but it makes no difference. *Marble Madness* has set a whole new standard for coin-op conversions to home micros. Out now for the Amiga and should be available on the 64 before Christmas. Start saving.

Program Ghostbusters Type Arcade Micro Atari 800 **Price** £9.99 **Supplier** Activation, 23 Pond Street, London NW3.

Program Thrust Type Arcade Micro Atari XL/XE **Price** £1.99 **Supplier** Firebird, 74 New Oxford Street, London WC1.

Having decided that a BBC conversion of *Thrust* wasn't worth their while, Firebird have

come up with the goodies for Atari and Amstrad (you're going to have to wait for the PCW show to see it running on the Spectrum).

The good news is that these conversions are £6 odd cheaper than on the BBC (courtesy of Superior Software). The bad news is that both are considerably inferior to the excellent program.

Both are slower than the original, and while the Amstrad faithfully recreates the screen display, the Atari fails to do even that. The lack of speed seriously affects the playability and although it's true to say that I've seen worse conversion jobs, whatever made the game a classic on the Commodore and BBC is missing on these two. A severe case of 'play before you purchase'.



BBC

Program Who Dares Wins II Type Arcade Micro BBC B **Price** £9.95 disc only **Supplier** Alligata Software, 1 Orange Street, Sheffield S1 4DW.

Program Urdu Word Processor Type Utility Micro BBC B Price £40.00 + VAT disc, £84.00 + VAT (Rm) Supplier Micropraxis Ltd, Enterprise Workshops, Nursery Street, Sheffield S3 8GG.

Program Covey Type Arcade Micro BBC/Electron Price £1.99 Supplier Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

CBM 64

Program Strike Force Harrier Type Arcade Simulation Micro CBM 64 Price £9.95 tape, £12.95 disc. Supplier Mirrorsoft, Purnell Book Centre, Paulton, Bristol BS18 9Q.

Program Culton 64 Drawing Board Type Utility Micro CBM 64/128 Price £33.35 disc, £56.35 disc + cartridge Supplier Culton Sales, 34 Mount Street, Dorking, Surrey.

Program Mission AD Type Arcade Micro CBM 64 Price £9.95 tape, £14.95 disc Supplier Odin Computer Graphics, 74 New Oxford Street, London W1.

Program ICUPR Type Arcade Micro CBM 64 Price £x.xx tape, £13.95 disc Supplier Odin Computer Graphics, 74 New Oxford Street, London W1.

Program The Boggit Type Adventure Micro CBM 64 Price £7.95 Supplier CRL, 9 Kings Yards, Carpenter's Road, London E15 2HD.

Program Clean-up Time Type arcade Micro CBM 64 Price £1.99 Supplier Players Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

Program Velocipede II Type Arcade Micro CBM 64 Price £1.99 Supplier Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

Program Ronald Rubberduck Type Arcade Micro CBM 64 Price £1.99 Supplier Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

C16/Plus/4

Program Auriga Type Arcade Micro C16/Plus/4 Price £1.99 Supplier Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

Program Leaper Type Arcade Micro C16/Plus/4 Price £2.99 Supplier Bug-Byte, Argus Press Software, Victory House Leicester Place, London WC2H.

Program Jail Break Type Arcade Micro C16/Plus/4 Price £2.99 Supplier Bug-Byte, Victory House, Leicester Place, London WC2.

Program Speed King Type Arcade Micro C16/Plus/4 Price £2.99 Supplier Mastertronic, 8-10 Paul Street, London EC2.

MSX

Program Steve Davis Snooker Type Arcade Micro MSX Price £8.95 Supplier CDS Software, CDS House, Beckett Road, Doncaster, South Yorkshire DN2 4AD.



Spectrum

Program ICUPS Type Arcade Micro Spectrum Price £8.95 Supplier Odin Computer Graphics, 74 New Oxford Street, London W1.

Program PSI-Chess Type Strategy Micro Spectrum Price £9.95 Supplier The

Edge, 4th Floor, Dudley House, 36-38 Southampton Street, Covent Garden, London WC2E 7HE.

Program Shewsbury Key Type Adventure Micro Spectrum Price £1.99 Supplier Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

Program Zaccaron Mystery Type Adventure Micro Spectrum Price £1.99 Supplier Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

Program Lap of the Gods Type Arcade Adventure Micro Spectrum Price £1.99 Supplier Mastertronic, 8-10 Paul Street, London EC2.

Program Knight Games 2 Type Compilation Micro Spectrum Price £2.99 Supplier Black Knight Computers, 60 Slades Drive, Chislehurst, Kent BR7 6JX.

Program Zzzz Type Adventure Micro Spectrum Price £1.99 Supplier Mastertronic, 8-10 Paul Street, London EC2.

Program Universal Hero Type Arcade Adventure Micro Spectrum Price £1.99 Supplier Mastertronic, 8-10 Paul Street, London EC2.

Program Kane Type Arcade Micro Spectrum Price £1.99 Supplier Mastertronic, 8-10 Paul Street, London EC2.



Program Octagon Squad Type Arcade Adventure MI-

cro Spectrum Price £1.99 Supplier Mastertronic, 8-10 Paul Street, London EC2.

Program Johnny Reb II Type Simulation Micro Spectrum Price £9.99 Supplier Loh-Iorion, Argus Press Software Group, Victory House, Leicester Place, London WC2 7NB.

Program Mission Omega Type Strategy Micro Spectrum Price £9.95 Supplier Mind Games, Argus Press, Software Group, Victory House, Leicester Place, London WC2H 7NB.



Program Strike Force Harrier Type Arcade Simulation Micro Spectrum Price £9.95 tape Supplier Mirrorsoft, Purnell Book Centre, Paulton, Bristol BS18 5LQ.

I recently came back to this title on another machine, (it originally came out on the BBC quite a way back) and was pleased to find that it stood the test of time remarkably well.

What's more, it stands the test of a good 'simulation' well, too, in that if you don't pay attention, you crash a lot.

All the arcade and strategic elements are still there, and the action is fast and furious as ever. If you're looking for a vertical lift from your Spectrum; this is as good as you'll get.

Spectrum 128

Program Ghostbusters Type Arcade Micro Spectrum 128 Price £9.99 Supplier Activision, 23 Pond Street, London NW3.

How are the mighty fallen NEXT WEEK

The text for today's sermon is: "How are the mighty fallen". Although in this instance there ought to be a question mark on the end there.

Specifically, how did Commodore, once the world's number one mover of microcomputers, come to be the shambling relic we know today?

It takes more than bad luck to achieve what Commodore has achieved in the past 18 months. It takes a kind of awe-inspiring capacity for self-destruction.

But first, let's establish some credentials. I'm a Commodore fan. I have been since I willingly forked out nearly £300 for a Vic 20 and cassette player these many years ago (the cassette player, incidentally didn't work.)

I was still a fan when I brought a smile to the face of my local dealer, and a coronary to my bank manager, when I lashed out another £500 on a Commodore 64 and disc drive.

So (cue violins) it is more in sadness than in anger that I admit that, were I looking for another machine, I'd be making room on my desk for an Atari ST, not an Amiga.

It's not difficult to pinpoint Commodore's mistake. It went wrong when it launched the C16 and Plus/4. The last thing Commodore needed at that point was a couple of dodos like those two.

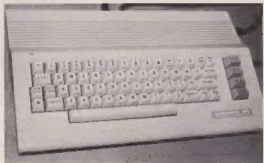
The error was compounded by time-wasting excur-

sions into the IBM-compatible market. Then the company fouled up the C128 launch.

The 128 is a great machine, but you'd barely know it existed. To most people it's just a 64 with extra memory in a pretty, new box. But what's

Commodore has been closing factories and sacking workers for the past year.

Yes, it's been a tough year. Acorn shot itself in the foot and almost bled to death; Sinclair was snatched from the brink by Alan Sugar; and



that extra memory worth when there's next to no software making use of it?

Now we're going to get a revamped 64. It looks a bit like the 128 but without the extra memory, and with the 64's lousy Basic.

What it will have that's worthwhile is Geos. But Geos is a disc-based operating system and the 64c doesn't have a built-in disc. It cries out for a mouse, but there's no mouse support.

How long, Lord, how long? Now Commodore might argue that the 16, the Plus/4, the PC, and the 128 have been successful in their own terms.

Which is why, no doubt,

sundry others have joined the long list of casualties.

But in the same time Amstrad has made the competition look like a bunch of rank amateurs, Apple has pulled itself out of trouble, and Atari is now a long way from being the malignant cancer that almost destroyed the Warner Bros empire.

If the radical surgery that Commodore has had to endure pulls the company through, no-one will be more delighted than me.

But neither the 64c nor the Amiga—the Concorde of the computer industry—is going to do it.

Peter Worlock

PCW show preview

Britain's premier exhibition for home computers, the *Personal Computer World Show*, kicks off at Olympia on September 3. If you want to know who, and what, will be there, don't miss our show preview. Includes first pictures of *Laserzone*, from new Gargoyle label FTL.

Hardware

Commodore 64 owners—fed up with your excruciatingly slow 1541 disc drive? Chris Jenkins looks at DolphinDOS, a circuit board device which claims to speed up operations considerably.

Software



Another battle of the chess giants—this time The Edge puts up *Psi-Chess* to challenge *Colossus*'s latest conversion to the Spectrum.

Hackers



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